THE SIGHT-SAVING REVIEW

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"Let There Be Sight"

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The Eyes in Childhood*

J. Milton Griscom, M.D.

JUST as certain diseases are common to childhood, there are special hazards to sight from eyestrain and accidents which occur in the playing of games, in school work, and in other activities of boys and girls.

IT IS not the purpose of this paper to present anything essentially new concerning the conservation of vision in children, but rather to recall some of the more important ophthalmic questions on which those in general practice are frequently consulted. The greatest emphasis naturally should be placed on prevention, since eyes damaged by injury or disease often regain only a fraction of their normal visual acuity; and even though this may affect one eye only, the resulting interference with binocular vision is a serious matter and a real handicap in any phase of modern life.

In the industrial field much has been accomplished through education and regulation to prevent injuries, but with children the problem is not so easy. The legal restrictions placed on the sale of fireworks and other explosives have greatly reduced the incidence of eye injuries during the Fourth of July period, but we must depend on further education among parents if we are to lessen the loss of vision from accidents which are generally beyond control by law and which are usually called household accidents. It would seem that ordinary precaution and common sense would lead mothers and fathers to keep from babies and children such articles as knives, forks and scissors; to warn the boys of the family of the danger of cutting toward the face when using a pen-knife; to instruct those possessing air-rifles or any other form of weapon as to its proper use and its possible dangers; to discourage such

* Read before the Philadelphia County Medical Society, Philadelphia, Pa., November 12, 1930, under the Dr. Mary Fisher Foundation Annual Ophthalmological Lectures.

games as "peggy," where the peg of wood, after being hit, flies directly toward the face; and to see that children who wear glasses take them off before playing games wherein they may be broken. Such accidents are to be prevented only by parental education, which really should begin as pre-parental education during high school days. If during this impressionable age a few direct and clear instructions were given regarding ocular hygiene, there would eventually be fewer children with partially or totally blind eyes.

Children with myopia of such a high degree that they cannot participate in any form of sport without glasses should be protected by wearing non-shatterable lenses when exposed to possible breakage. The ophthalmologist is primarily responsible for such instruction and advice, but an additional check by the family medical adviser may prevent trouble.

In line with this subject is the question of damage to the eyes from broken automobile windshields. Injuries from flying pieces of glass increase each year as the number of automobile accidents increase, and children suffer their share. The time has arrived when the medical profession should agitate for the general use of non-shatterable windshield glass by automobile manufacturers. Such uniform equipment would undoubtedly save the personal and economic loss which each year occurs from damaged or lost eyes following automobile crashes.

Finally, under the consideration of eye injuries, it must be remembered that in any wound involving the ciliary region, which is the zone from six to eight millimeters behind the margin of the cornea, there is always the possibility of sympathetic inflammation of the fellow eye. In this, disease prevention is of utmost importance, since, once it becomes affected, almost certain impairment and often loss of sight follow in the uninjured eye. Beware of the child's eye with a penetrating wound of the ciliary region, even though healing has taken place.

Ocular inflammations which may result in partial or total blindness are preventable. Perhaps the most striking example of this is the Credé treatment for preventing babies' sore eyes, with which everyone in general practice is familiar. The number of infants who acquire ophthalmia neonatorum has been reduced from over ten per cent to less than one-half per cent through the

use of a one per cent solution of nitrate of silver dropped in the conjunctival sac immediately after birth. This should be a routine procedure in every delivery, regardless of whether there is or is not any evidence of active infection in the mother, since latent infections may give rise to ophthalmia. Despite the great reduction in the number of victims of this disease, there are still too many eyes lost each year. The remedy lies in the use of the Credé treatment at every birth.

A common disease in childhood which should command the attention of physicians and parents is phlyctenular keratitis. The underlying condition is the so-called strumous diathesis dependent on bone or glandular tuberculosis, or secondary to prolonged errors of diet. The corneal ulcers which form frequently leave dense scars, or, if they perforate, cause serious impairment to the deeper structures of the eye. In either case vision may be permanently affected. The education of parents concerning general hygiene and diet in children would greatly reduce the incidence of this disease.

There are certain eye affections which are not preventable and which are comparatively innocent unless they are converted into something more serious because of improper treatment. Foreign bodies on the conjunctiva or cornea, if removed promptly under proper precautions, seldom do any damage, but if the corner druggist or a neighbor is consulted who operates with a toothpick or a saliva moistened handkerchief, or inserts a flaxseed in the conjunctival sac, a purulent conjunctivitis or a cornea damaged through ulceration, may result.

When styes form they should be permitted to follow the course of any localized pyogenic infection. If they are prematurely opened with a pin or needle, or if a poultice is applied, a serious infection may result. Children suffering from styes are frequently treated with argyrol. This remedy has its place in ocular therapeutics, but it is a distinctly secondary one, and even in this rôle is more irritating than useful unless the solution is freshly prepared. It should never have a place on the family medicine shelf, not only for the reason just stated, but also because it is very easy to confuse argyrol with tincture of iodine. This confusion is by no means theoretical and its practical importance could be proved by numer-

ous instances where the substitution of one for the other has led to disastrous results.

The prevention of partial or complete blindness due to inflammatory diseases of the eye is therefore dependent on parental education, concerning what not to do as well as what should be done, in addition to preventive measures and early treatment by the physician in charge.

The question of the need of and the use of glasses is receiving increased attention from those interested in the maintenance of both comfortable and good vision in children. A notable example of this work is seen in the medical supervision of the Philadelphia public schools, where the early recognition and correction of errors of refraction have been a routine procedure for many years. The sight-saving classes are of particular benefit to those who suffer from progressive myopia. This care should be extended to the examination of preschool children, particularly those who have a family history of myopia. Each child with a myopic inheritance should be treated as a potential myope, and it should have frequent and careful examinations as well as the regulation of the amount of and the conditions surrounding near work. In all children the use of a cycloplegic is essential for an accurate estimation of the kind and extent of refractive error present. Especially in myopia is this method indicated, since an examination while accommodation is active practically always leads to an overcorrection, and glasses which are too strong in nearsightedness tend to cause strain instead of relieving it.

The ophthalmologist has only a limited clinical opportunity to take a part in the program for the prevention of blindness. His active professional work concerns itself largely with the repair or correction of damage already done. Only indirectly, through close co-operation with the family physician, or through social agencies working along the line of pre-parental and parental education, can we be of constructive service in the reduction of blindness.

Eye Protection in Industry

Louis Resnick

TO reduce the eye hazards of industrial occupations, the author suggests: (1) providing goggles and machine guards; (2) revision of machinery and the process of work; (3) training workmen and foremen in safe practices.

THE eye hazards of industrial occupations have come to be among the most serious of all causes of blindness. While no extensive authentic statistics are available, it has been conservatively estimated that at least 15 per cent of the blind of America lost their sight because of occupational hazards.

Considerable progress has been made in the development of mechanical safeguards for the eyes of factory workers. Some large industrial organizations have brought about marked reductions in the number and severity of eye accidents among their workers. Considering industry as a whole, however, the problem of protecting the eyes of employees is still largely unsolved.

In terms of workmen's compensation, the eye hazards of industry are more serious than any other group of accident hazards, with the single exception of those resulting in death. More money is paid by employers each year as compensation for eye injuries than is paid for injuries to any other part of the body. In the principal industrial states, a total of more than $10,000,000 a year is paid to workmen who have lost all or part of their sight. This, the direct cost, presents only part of the picture.

Analysis of some 75,000 accidents by the Travelers Insurance Company* shows that the indirect loss to industry of accidents generally is four times as great as the direct loss, namely, compensation payments. When a factory worker—man or woman—suffers a serious eye injury, a long chain of costly interruption of

*Heinrich, H. W., *Industrial Accident Prevention*, New York: McGraw-Hill Book Co., 1931.

work ensues; the injured employee's fellow workers lose time in rendering first aid and getting him to a doctor; other workmen lose time watching the proceedings; the foremen and still other men spend time investigating the circumstances of the accident; the general morale of the department, and sometimes of the entire plant, is impaired; often valuable material is destroyed; follow-up investigations consume time. These are only a few of the indirect costs of eye injuries.

It is estimated that these indirect costs—on the basis of actual experiences in the 75,000 instances studied—amount to at least four times the primary cost, namely, the compensation award to the injured person. It appears then that the actual cost of eye injuries in industry is in the neighborhood of $50,000,000 a year.

That the eye hazards of industry are of the utmost concern to employers, employees and the community as a whole becomes immediately apparent, from an entirely different point of view, when one considers this simple fact: when an arm or a leg is lost as the result of an accident, it can nearly always be replaced by an artificial limb which can do almost anything the human member could do; but when the sight of an eye is destroyed by accident, the loss is irreplaceable—you cannot see a thing through an artificial eye.

What are the eye hazards of industry? Briefly they are the accident hazards, the disease hazards and the hazards of excessive eye fatigue. The accident hazards are produced chiefly by flying chips of metal, wood, rock or other hard substances; by falling or thrown tools, raw materials and other large objects; by the splashing of molten metal or injurious chemicals. Disease hazards affecting the eyes with which industry is or should be concerned are the venereal diseases, trachoma, cataract, nystagmus and the general toxic effects of those poisonous chemicals commonly used in many industries which may affect the eyes as well as other organs. The hazards of excessive eye fatigue are those due to insufficient light, too much light (glare), flickering light, or too long neglect of eye conditions requiring refraction or other corrective measures.

The accident hazards are, of course, the most serious of all these. How can these hazards be eliminated or their effects

counteracted? Briefly, they can be prevented in three ways: (1) by the provision of protective equipment, such as goggles and headmasks for individual workmen, screens of metal, wood or canvass between workmen, glass shields protecting the point of operation of emery wheels and other machines; (2) by revision of the process of work, by redesign of tools and machines, by rearrangement of machines and other plant equipment; and (3) by rules of work, by supervision, training and education in safe practices of workmen and foremen.

In the last connection, too much emphasis cannot be placed on two facts: (1) that mandatory rules concerning the use of goggles and other protective devices in particular operations and the strict enforcement of these rules are proving the most effective means of reducing eye injuries in the plants of such important companies as the United States Steel Corporation, the Pullman Company and the Union Pacific System; and (2) that it is worse than futile to establish mandatory or other stringent rules in plants where they cannot be enforced or where they are not supplemented by year-round educational activities and supervision that is not only sympathetic to organized accident prevention, but sincerely enthusiastic about it.

The National Society for the Prevention of Blindness has recently undertaken the formulation of a self-appraisal for safety engineers and other executives concerned with the conservation of vision in industry. This appraisal form, when completed, should incidentally constitute a program for 100 per cent eye protection in industry.

There are already included in the preliminary draft of the self-appraisal 59 questions. Only the plant which can answer each of these questions in the affirmative can truly be said to be doing a thoroughgoing job of safeguarding the sight of its employees. Even these 59 items, however, do not completely cover all that it is possible for an industry to do for the protection of the eyes of its workers.

Too often it is assumed in particular plants that if goggles have been provided, signs and bulletins posted, books of safety rules distributed and orders issued to foremen concerning their responsibility for accident prevention, the whole job of eye protection has

been done. If the self-appraisal form does nothing more, it will at least show how far wrong this notion is.

This appraisal—especially when it incorporates the many constructive suggestions that are being made for its improvement—should enable the individual safety engineer or plant manager to find out exactly where his property stands in comparison with the ideal in the matter of protecting the eyes of the company's employees. It should enable those responsible for accident prevention to formulate immediately a program for thoroughgoing eye protection.

The appraisal which is presented here is still in process of development. The National Society for the Prevention of Blindness welcomes the suggestions of all those directly concerned with eye protection in industry for the improvement of the form and for its ultimate utilization.

A Self-Appraisal for Safety Engineers and Other Executives Concerned with Conservation of Vision in Industry

I. THE PLANT

PROTECTION AGAINST ACCIDENT HAZARDS — Points Scored

1. Are goggles and head masks available for each employee exposed to the danger of:
   (a) splashing of molten metal or injurious chemicals?.... _____
   (b) flying dust or particles of emery, metal, rock, wood or other hard substances?..... _____
   (c) falling or thrown tools or other large objects?..... _____
2. Do the goggles meet the required strength specified by the National Head and Eye Code?..... _____
3. Are the goggles or other protective devices the most comfortable that may be secured?..... _____
4. Are goggles fitted to the individual workman?..... _____
5. Are emery wheels equipped with glass shields?..... _____
6. Is some one person charged with responsibility for cleaning and replacing pitted or broken emery wheel shields?.. _____

Points Scored

7. Are emery wheels and other sources of dust or flying particles equipped with exhausts to draw off such particles?.. _____

8. Is there adequate provision for keeping tools in good condition?—

   (a) by periodic inspection of tools for mushroomed or burred heads, for cracks or other defects?..... _____

   (b) through definite responsibility for dressing tools?.... _____

9. Are the points of operation of lathes, drills, punch presses and other high speed machine tools protected by glass or wire mesh guards?..... _____

10. Is the general housekeeping of the plant such as to reduce to a minimum the possibility of—

    (a) workmen falling or stumbling?..... _____

    (b) tools or other objects falling from high places?..... _____

11. Is there a properly equipped and staffed first-aid room?... _____

PROTECTION AGAINST HEALTH HAZARDS

1. Are there adequate facilities for washing—including hot water and soap—conveniently located and available to all workers without long waiting?..... _____

2. Are individual towels available? (Use of roller towels in public places is forbidden in most states as a precaution against the spread of communicable disease)..... _____

3. (a) Is each worker needing a head mask or goggles provided with a pair for his exclusive use? (The use of the same goggles by more than one person involves the danger of communication of disease)..... _____

   (b) Is there provision for sterilizing goggles turned in by one employee before they are issued to another?..... _____

4. Is adequate exhaust equipment provided to draw off poisonous fumes and gases?..... _____

5. Are respirators provided for all workers exposed to the dust or fumes of injurious chemicals? (Such exposure often leads to impairment of vision as well as other bodily injuries)..... _____

Points Scored

Where respirators are necessary, is there provision—

(a) for an individual pair for each worker? ..... _____

(b) for sterilization of respirators turned in by one workman and handed to another? ..... _____

6. Are plant layout and machinery arrangement such as to make it unnecessary for any employee to work in a strained position for long periods? (Subjection of the eyes to abnormal and unaccustomed motions may lead to serious eye disorders) ..... _____

7. Is there adequate provision of proper goggles and head masks to protect workers from injurious heat and light rays? ..... _____

PROTECTION AGAINST THE HAZARDS OF UNDUE EYE FATIGUE

1. Are prescription lenses provided for all employees with defective vision—

(a) without charge to the employee? ..... _____

(b) employee pays half? ..... _____

(c) employee pays whole cost? ..... _____

2. Does a foot-candle meter check of illumination in the plant show conformance with the minimum intensities of light recommended by the American Standard Code of Lighting Factories, Mills and Other Work Places? ..... _____

3. Is illumination in the plant devoid of—

(a) flickering lights? ..... _____

(b) sharply contrasted lights and shadows? ..... _____

(c) permanent or intermittent glare? ..... _____

4. Is the plant arrangement such as to make unnecessary exposure of employees' eyes to—

(a) glare of the sun? ..... _____

(b) unshaded filaments of electric light? ..... _____

(c) intense open fires or carbon lights? ..... _____

(d) reflection from polished surfaces? ..... _____

Points Scored

II. THE WORKER

1. Is good vision a prerequisite to employment in your plant? ..... _____
2. Are the eyes of all workers examined at the time of employment? ..... _____
3. Are the eyes of only skilled employees examined? ..... _____
4. Is a report of the findings in such examination given to the employee or applicant for work? ..... _____
5. Are employees' eyes re-examined—
   (a) at stated periods—biannually? annually? or semi-annually? (state how often) ..... _____
   (b) only when symptoms of possible eye disorders appear? ..... _____
6. Is there provision for general physical examination of employee—
   (a) at the time of employment? ..... _____
   (b) at regular recurring intervals? ..... _____
   (c) when symptoms of disorders appear? ..... _____
7. Are workmen with seriously defective vision or with disease involving the eyes referred to—
   (a) an oculist? ..... _____
   (b) a general medical practitioner or family doctor? ..... _____

III. THE JOB

Assignment of Work

1. Is the visual acuity of each employee taken into account in assignment of work? ..... _____
   (a) Is it done through job analysis and test of vision with Snellen Letter Chart? ..... _____
   or
   (b) Is it left to the judgment of personnel manager, foreman or other supervisors? ..... _____
2. Is there a periodic check of the relation of worker's vision to the character and quality of his job? (If so, state how often) ..... _____

	Points Scored
SAFETY RULES	
1. Is there a mandatory rule concerning the wearing of goggles or masks in prescribed occupations and is this rule conscientiously enforced?.....	_____
2. Does such a mandatory rule apply to foremen, other supervisors and plant visitors as well as to workmen?.....	_____
EDUCATIONAL ACTIVITIES	
1. Are accurate records kept of—	
(a) number, nature and cause of eye injuries;	
(b) frequency and severity rate of such injuries;	
(c) compensation and other costs due to such injuries....	_____
2. Is there a definite and permanent program of safety education, including instruction in protection of eyes?.....	_____
Total Credit.....	1000 points

Experiences of an Exchange Teacher in the Myope Classes in Glasgow, Scotland*

Louise Rush

THE "myope classes" of England and Scotland correspond to the "sight-saving classes" in the United States and Canada for children with defective vision. A demonstration sight-saving class will be started soon in Paris. In many other countries, too, educators are now giving serious attention to the special requirements for teaching visually handicapped children.

FIRST of all, it may interest you to know something about that organization, the League of the Empire, under which we teachers may go on exchange. It is founded, broadly speaking, for the promotion of better understanding between the different parts of the Empire. One way of doing this is by the exchange of letters between the school children of all parts of the Empire. Another way is by the interchange of teachers. All business is managed by a central office in London; in each of the dominions is a branch office; in fact, in Canada there is one in each province. Generally speaking, the teachers take each other's work but are paid by their home board at the same rate as if they were still at home. This opportunity for exchange is deemed a great privilege, and in our city far more teachers apply than the twelve who are allowed to go.

What may be done in the leisure time makes an appeal to the average teacher, and most teachers prefer to go to London because of its history, its literary shrines, its beauty, its being the general center of all things and the very embodiment of our Empire. But no matter where they are sent, all agree that it is worth the experience a hundred times over.

* Presented at the Annual Conference of the National Society for the Prevention of Blindness, November 17, 1930.

But the work in school is hard—one series of adjustments. One is not familiar with the curriculum, the organization of the schools is very different, methods are new to us, equipment and supplies have to be learned, the very vocabulary of school life has to be mastered. My pupils did not understand my requests or commands. When I said, "Come to me," no one moved; but when I learned to say, "Come away oot," all was well. Besides, no matter what responsibility one has had at home, one is a subordinate there. I was surrounded with kindness and sympathy and helpfulness in my work in Glasgow from first to last; but the experience is not always that. One meets a mighty conservatism, and sometimes there is an ill-concealed condescension toward colonials.

I was not anxious to go on exchange, knowing the disadvantages as well as the advantages. But when word came to Toronto that there was a myope teacher in Glasgow who wished to come on exchange, it was conceded generally a coincidence that within such a limited sphere such could be arranged. The powers-that-be thought it a fine opportunity for me to go and work side by side with teachers in my line there. I accepted on condition that I would be placed so as to be working actually in the same building with other teachers of myopic classes. So August, 1929, found me in Centre Street School in Glasgow, a literal exchange, the Authority having stipulated that only a teacher of training and experience in this work would be accepted.

I knew before I went that my school would be in the slums. In the discussion in the Imperial House of Commons last winter on the Slum Clearance Bill it was brought out that Glasgow had worse slums even than London.

An aerial panorama of the school and surroundings would reveal a paved playground extending from one street to another, screened from public view by a high iron fence painted a bright green and hedged about by huge, ugly, grim tenements, enlivened by the railroad and its "goods" (freight) station. In this enclosure are two gray stone buildings, rather small; the janitor's house, the sheds for shelter on rainy days (in much demand), and the lavatories. At the "interval," about 10:30, many mothers all be-shawled, with a baby tucked in dexterously and other small people in tow,

came with a "play-piece" or some milk or tea for their bairnies. I thought, as I saw them in all their hopeless poverty, "How lovely to see such solicitude in such surroundings!" But when I voiced my sentiments in the staff room when we took our morning tea, at eleven, I was told that these ideal mothers before whose shrine I had been bowing had been too lazy to get up and give their offspring a right and proper breakfast before they ran to school.

Though the school was old, it was in fine repair and had recently been painted a bright green about the windows, with doors painted red. Strange colors, thought I at first, but I soon recognized the wisdom of it—it made a bright spot, literally, for the neighborhood.

The arrangement of classrooms would, no doubt, strike you as it did me. The school buildings are not huge structures, as with us, so that usually on one side of the "passage" would be just room for three classrooms arranged with what struck me as almost temporary walls. I am sure they could be shoved aside, the upper half was glass, the lower part opaque and the upper glass clear. Why? To let in all the precious light there is! And in order to get to two of these three rooms all pupils and teachers must pass through the first or outer room. At first I found this disconcerting —I was in the middle—since there was little privacy and all extra commotion made itself felt beyond one's own room.

My room was about one-third the size of my room at home and only by going sideways could I manage the aisles. But it was as bright a room as I saw anywhere; the aspect was southern, with no building very close to my windows. When the sun did shine we got it and one is so grateful for it! The sky is so beautiful in Scotland, so blue, with the fleeciest, puffiest clouds.

When I looked out I saw before me the court of an ugly, dingy tenement, built like a U, and I looked into the opening of the U. It was four or five stories high, built of stone, blackened with age, plain, of course, rows and rows of windows, some of them with bedraggled sash curtains, a rare few tidy, and many guiltless of any—ugly, deadening, pathetic. One or two had a window box in which were bravely blooming a few of the unhealthiest, most anemic looking marigolds it has ever been my luck to meet. Attached to each window and extending from it was a rope or a rod, and on these there always dangled a bit of washing, a pullover,

a man's shirt, a child's faded pinnie. I had never thought before of the difficulty of getting the clothes dry! But when the sun shone unexpectedly the court blossomed out at once into long lines of bedding and underwear criss-crossed—always a puzzle to me. How did they have them ready for the sun, and what would they have done had it not shone? I never knew. In all that district there was not a green tree, a bit of grass, any blooming, living thing! After our beautiful tree-shaded streets in Toronto, I stood aghast!

There were two features about that classroom that struck me. Each child sat in a little chair before an individual blackboard about a yard square. This board was adjusted to the eye level of the child by a rod which fitted into corresponding notches. The child was taught to sit upright and with quite a straight arm write with chalk upon his board. Thus, perforce, he wrote largely, and at his eye level. The other feature was the wall blackboard, a sort of double affair like the sashes of a window, adjusted by pulleys, ropes, and balance weights. Thus, again, the work could be fitted to the eye level of the pupils; in a room with little wall space it had the extra advantage of providing a double amount of blackboard surface, since it was as high as a window and either half could be pulled down when desired. Besides this, there was an easel blackboard about which I brought my class for much teaching.

And what shall I say of my pupils? I hope they have as kindly a memory of me as I have of them. We were strangers and we spoke a different language; it was a month at least before we caught on to each other's vocabulary. These were children and consequently loving and lovable. They attracted me to an amazing degree and I simply slipped away from them at the end, dreading a final goodbye. There were twenty-one of them, the average age about nine. Some were undersized because undernourished; some were surprisingly normal, with the bluest of eyes and rosiest of cheeks. How it was achieved was beyond me! They were seldom ragged or so poorly clad as to command commiseration, or hungry, for the Authority and the much maligned "dole" see to it that no one starves or is cold in the old land. Remember that in this time of depression! I would find a small person below my tall desk some morning, "Please, miss, my mother says my boots should be

sorted," and so a form would be filled and the boots sent up to the central office. Or, "Please, miss, I am in need of a pair of troosers." The Authority suits and dresses were pretty much of one pattern and material, so it was easy to spot the indigent at play time.

But, with rare exceptions, they were not clean, but dreadfully unclean. And running noses with no hankies! But there is always a way out; packets of paper serviettes from "Woolworth's," a pan of water, a cake of soap, an unfriendly brush worked wonders with the line-up every morning. But, of course, I could reach only hands and faces. One gets very dirty quickly in the murky atmosphere of industrial Glasgow. But for a very small sum a mother can take her family to the baths, so that there is not a very good reason for this condition unless we remember that living under such conditions as they do is not conducive to clean thinking.

In each myopic department there is a head mistress, who is paid a considerable sum extra for each teacher under her, though the teachers draw the salary of the teachers of the ordinary scale. This head gives real direction to the program and routine of her department and accepts all responsibility therefor. She decides the course of study; makes the time tables; handles the discipline, and compiles a summary of all reports. The head master of the school does not dictate to her in any way, except in matters pertaining to the school as a whole, such as heating, ventilation, fire drills. There is not, as far as I could judge, any effort to follow the scheme of work set down by the authority for the elementary schools of the city. The head mistress of the myope classes has great freedom of choice as to program. There is an elusiveness to the view in the old country in respect to the attitude toward the education of the lower classes. It seems to me that there is a certain mental attainment for each class of society; beyond it they cannot, nay, must not, pass. A child is to be educated for the niche he is to fill and it is likely to be the same niche as his forebears; there is little thought (I may be wrong) to prepare him for any other class than that into which he was born. With these handicapped children even less is expected, so less education for their niche would be even below the average.

There are outstanding features of the regular program and these

are incorporated into that of the myopic classes. There are some especially fine things in the old country schools indicative of the older culture of the people. Thus in Glasgow, three or four times a week is a period just for poetry, apart from the regular reading lesson—just for cultivation of and delight in poetry with an interest toward proper voice training and modulation. These pupils can repeat (and do so beautifully) a great many poems—Shakespeare's as well as the modern poems of Rose Fyleman, A. A. Milne, and Walter de la Mare. They sing beautifully, too, and their choice of songs is good. In Glasgow it was a treat to hear them singing the old Scotch songs. What an instilling and deepening of the love of the country they gave!

Have you ever stopped to think of the molding influence on the individual of a half-hour's Bible study every school day, even up through the secondary school? Almost half of my children were Roman Catholics who obtained this work at some adjoining Roman Catholic school before coming to me. But we learned standard hymns, many beautiful Bible selections and stories suited to their age. Of course their conception of the circumstances was often new to me. Shall I tell you Edward's rendering of the story of Christ in the Temple which I had taught them but which he had heard before at Sunday school? Edward is "aboot" eight, dirty, his "jersey" covered with the remains of many meals all taken at the expense of the Authority, but sturdy and confident that the teacher esteems him highly! (He isn't, out there.) He is an albino; his mother is ashamed that she has so many children who are albinos, so she hennas his hair and makes an atrocious job of it, thus making a sorry spectacle, albeit somewhat overcome by his keen blue eyes, his fair skin and rosy cheeks. But to get on with the story. After recounting the first fact of the family going up to the feast and their return journey, he went on something like this: "His Mother Mary thought her wee boy was playin' aboot with the other wee boys but she cudna find hem (that's not an error, they always make their short i's into e's). She looked into the wee corners and lobbies an' every place and afters while she heard a lot of men speakin' and listened and looked in and saw Jesus among the wise men and the meenesters. She waited quiet like for awa, then shouted 'Jesus' quiet like but he paid not

attention and so she shouted louder and he came oot. 'What were ye talkin' to them meenesters for, Jesus?' 'I was learnin' aboot my Father God.' " And then, "She tried to forget aboot a' that." And in conclusion: "His daddy was a joiner makin' cupboards and presses and could fix yer windy if it needed it. Jesus used to bring in big planks for his daddy to cut up while his mother set oot knittin'."

Physical drill is given much attention. The courage and virility of the old country are amazing and stimulating in their attack on her problems. In that city they recognize the danger of slum life on the young child and strive to meet it while the housing schemes are developing by giving a tremendous place on their school program to physical training and organized play. There is a drill hall in every school, and in favorable weather there is a class, even more than one at a time, in the playground under the direction of a teacher.

There is an individualism about methods everywhere, but on the whole I found that script was used in the myopic classes in Glasgow though printing is the method used in the ordinary class. No books are used for any purpose—no readers as you have. In the Centre Street school the teachers print on one of the blackboards an extract for oral and written reading used also for spelling. There is much repetition used in old country teaching and the children read very well although they have such little practice. The larger boys go to "manual" and the girls to cooking. The latter are also taught knitting, plain. Over there it takes much practice and patience to cope with pounds, shillings and pence. I used to marvel how quickly, for instance, the salesman reckoned ¾ yd. silk at 6s., 11¼d. a yard.

I think the eyes of the children are watched carefully. The pupils are taken by guides to the clinic near by in a car sent by Authority when they need to go. The head receives all such instructions. Some go regularly once a week, some once a fortnight, others monthly. As a general rule, the doctor does not visit the class.

I asked and obtained permission to visit myopic schools in London the first week in January. Three schools were suggested to me. I was expected and everything was arranged for the least

waste of time, except the long distances I travelled. Mr. Shaw, the Special Schools Inspector, kindly met me at one of these centers and gave me a whole afternoon of his time. I shall rapidly mention the points peculiar to London. There, myopia is the standard of admission—"No fundamental eye defect except myopia," said Mr. Shaw. If a child cannot see a square E of the size of 2/5 inch at a distance of five metres, he is excluded. No child is admitted for nystagmus, keratitis, opacities, cataracts, etc., alone, but is admitted if these difficulties are associated with myopia.

The lighting is indifferent, so on dark days only oral teaching is permitted. In London is seen a blackboard that works like a huge roller towel; and here printing, not script, is in use. No individual blackboards are used in London, but a desk of simple character made in the London County Council workshops. The desk itself is at right angles to its upright support and turns up smartly, presenting a surface which, when up, is almost but not quite parallel with the child. This under portion is painted black and on it the pupils write with chalk at arm's length. The teachers are put to it for enough space in senior classes, so have extra boards which lean against the desk. No pencil or pen is used. The older pupils use large sheets of white paper, 54 by 20 inches, folded once and attached to the tops of their boards in various ways. There is no way, you see, of adjusting work to eye level, but Mr. Shaw is at work on a new desk to which paper can be attached like a roller towel. No printed texts of any kind are used—extracts are printed with a printing press of large type done by a senior pupil. The sheets are bound as in a book and in this way the older centers have accumulated a good bit of material.

There is an effort to correlate the work with the general course of study, but the pupils do not go into the regular class for any work. The brighter children sit for the scholarship examinations and some senior work is being carried on in the secondary and senior schools. Mr. Shaw is considering the question of teaching Braille to those pupils in myopic classes who will never be able to read ordinary books. They also use a remarkable machine which they think highly of, an Epidiascope, by means of which a page from a book, a

map, a nature study specimen may be thrown upon a sheet, thus enlarged so that the pupils may read the text.

I was also privileged to see schools in Sheffield, Paisley and in Drumpark, nearby.

This has been lengthy, but still only a hurried survey of what I experienced. There has been no time to put in incidents, stories, illustrations to brighten the bare account; it is rather dull, drab, choppy. But if you have preserved your old Sight-Saving Exchanges* you will find in them a very adequate account of Mrs. Hathaway's and Miss Peck's visits to these schools, told in a much better way than I have. But—it was the most wonderful year of my life. For the most, I took the part of spectator, watching, as it were, a show. At times I, too, took a part, broadening my outlook and deepening my sympathy. I came home with a better understanding of the problems of others and a greater love than ever for the land of my forebears.

* "A Brief Survey of Myope Classes in England and Scotland, September–October, 1926," *The Sight-Saving Class Exchange*, April, 1927.

Prevention of Blindness in India

C. G. Henderson, I.C.S.

MOST of the world's blind are found in Asia, where economic and social conditions are serious obstacles in the path of preventive work. This article about the 1,750,000 blind in India is the first of a series on conservation of vision in different countries to be published in this REVIEW from time to time.

ALL over the East, and in fact in most tropical and subtropical countries, blindness is very prevalent, and only of recent years have people begun to realize that much of this blindness can be relieved, and still more of it, if not most of it, could, with proper measures taken, be prevented. In Egypt, renowned for its sufferings from blindness, it was a gift of 43,000 pounds sterling made by Sir Ernest Cassel at the beginning of this century, that was the initiation of that fine ophthalmic service which, begun under the guidance of Mr. MacCallan, has now spread all over the country, and gives medical treatment to three or four hundred thousand patients a year. Turkey, Arabia, Africa, Persia, India and China are all countries where there is a very high incidence of blindness and suffering from eye disease, and where western medicine has not yet penetrated sufficiently deeply to make much impression on the vast masses of the mainly rural and illiterate populations. There is a great "trachoma belt" extending from China into Eastern Europe, stopped from spreading all over the West probably only by the higher standard of sanitation and cleanliness which the advanced European nations have attained. The late Dr. Ernst Fuchs of Vienna, after describing a visit paid by him to Abyssinia, where he found the eye conditions appalling and facilities for medical relief entirely absent, said in 1929 in his address to the American National Society for the Prevention of Blindness: "I think there is a very wide field for a Society which

extends its work beyond the frontiers of America, and more or less throughout the whole world. I think if something could be done in the South countries (and Abyssinia is only one instance), such as Turkestan, Afghanistan and others, along the line of work done in Egypt, establishing traveling hospitals, hospitals in tents which would treat the people of neighboring cities and stay there may be for eight or ten months, it would be of great benefit to these countries." "In Turkey," said Dr. Alden Hoover many years ago, "trachoma is so prevalent that there should be a clinic in every city of the country. The amount of defective vision and consequent inefficiency is incalculable. The prevention of blindness, by the control of trachoma, gonorrheal ophthalmia and smallpox, would be one of the greatest blessings America could give to Turkey." The field for the eye specialist, he says, is unlimited. So it is in India.

The extent to which blindness prevails in India is perhaps generally too little realized. The census figures which give us the number of the totally blind present a picture which is deplorable enough, but there is reason to fear that they fall very far short of the truth. For the whole of India the figure for totally blind persons shown in the census returns of 1921 is half a million, giving an incidence of about one and a half per thousand of the population. To anyone at all acquainted with the extent of blindness and eye disease everywhere prevailing, these figures must appear surprisingly low, and, in fact, the compilers of the reports themselves suspect that they are very unreliable. In the Nasik district, for which the census figures showed an incidence of 1.74 persons totally blind in both eyes per thousand of the population, an actual count was made by the writer in 1918–19 in four talukas in villages with a population of 212,000. Lists of blind and partly blind people having been prepared by the headman in every village, all these persons were actually inspected and an incidence of at least 4.38 totally blind per thousand was found. A good number of blind persons were no doubt missed in the preparation of the lists, so that the figure given is probably well below the facts. Similar counts were made in other areas. In the Ratnagiri district, which according to census figures showed an incidence of only 0.7 per thousand, there was found in three talukas, which are

probably among those least affected with eye disease, an actual incidence of at least 1.5. In the Bijapur district, for which the census incidence was given as a little less than 0.7, the real incidence found by this actual count made in 1920 varied from at least 3.5 per thousand in the worst talukas to 2.2 in the best, with an average incidence of at least 2.6. A few years ago a Deputy Commissioner in the United Provinces had a similar count made and discovered an incidence of no less than 9 per thousand. In the Palanpur Agency 7 per thousand has been found. If, as is not unlikely, this sort of error of underestimation in the census reports is general, then it is not unreasonable to suppose that the real incidence for India is more like 4.5 per thousand than the 1.5 per thousand indicated by the official census. India, according to the 1931 census, has now a population of 350,000,000, so that the number of totally blind persons may be estimated at 1,750,000.

These figures for total blindness by no means give the full picture, for they include only people totally blind in both eyes, and say nothing of the much greater number who, from neglected eye diseases, are partially or even nearly blind and whose happiness and efficiency are thus greatly impaired. In Egypt, the Department of Public Health accounts as totally blind any person who cannot count fingers at a distance of one meter. If such persons were counted in our statistics of total blindness in India, there is little doubt that the figures would be very much larger even than those indicated above. It has been stated that blindness is worse in Egypt than in India, but this statement is open to very serious doubt. Recently an analysis has been made of a very large number of eye patients attending the "camps" and dispensaries of the Blind Relief Associations in Western India, and it has been found that for every totally blind person there were nearly three persons with more or less damaged vision—the result of eye disease. Thus, in Sind, out of 11,947 patients, 1,967 were totally blind, and 5,284 persons had more or less seriously damaged eyes. A fair number of these were persons with immature cataracts or, in other words, people for whom total blindness was impending. The ratio of about three partially blind persons to every one totally blind has been found fairly constant wherever this analysis of patients has been made. It appears not unlikely that the true

ophthalmic condition of India would be represented by figures showing 1,500,000 to 2,000,000 totally blind persons, and in addition to these from 4,000,000 to 6,000,000 with more or less impaired eyesight.

The points with which practically we are most concerned is that much of the blindness that prevails is preventable blindness but unfortunately is not prevented; and secondly, that a great deal of the existing blindness is actually remediable but is not remedied. "No one," says Lt. Col. R. H. Elliot, writing in the *British Journal of Ophthalmology*, of May, 1919, "who has not worked in India can form a conception of the enormous amount of preventable and curable blindness which is laying its shadow over the health, happiness and usefulness of this great portion of our Empire." And the same writer, in another place, has said: "It is difficult for anyone who has not had first-hand experience of medical practice in the East to realize the state of things out there. Granular ophthalmia claims its victims by the ten thousands, whereas it is really a disease which, when properly treated at an early stage, should not cause the loss of a single eye. The neglect of the eyes of patients suffering from smallpox and other febrile conditions leads to a vast amount of blindness, while the treatment of mild ocular affections by irritant drugs is probably one of the most powerful of the evil factors that spread blindness broadcast throughout the land. Large numbers of men and women suffering from glaucoma, from cataract and from other curable diseases are allowed to hide in their villages like wounded animals, waiting only for their release by death. This is not an overdrawn picture. It is a statement of cold, hard, cruel facts well known to everyone who has practised or is practising medicine in the East."

The number of oculists in India is notoriously small. There are four major ophthalmic hospitals in the country; some few other hospitals have ophthalmic branches, and there are a certain number of dispensaries at which eye work is done; and some of the medical missionaries are oculists. There are also private practitioners who, however, are mostly congregated in the towns, whereas the population of India is, to the extent of 80 or 90 per cent, rural and agricultural. On the whole, the number of eye doctors is greatly inadequate. It is unnecessary to stress this as

it is universally admitted. There is, moreover, great need of an agency, able to come into close and personal touch with the scattered and rural population, find out the "hidden blind" and sufferers from eye disease and get them to the medical centers or, in the alternative, bring medical relief to the villages. The reader must visualize a vast country, mainly agricultural, inhabited by primitive, mostly illiterate, ignorant people, suspicious moreover to some extent of western medicine, living at distances from medical centers, with poor systems of communication. To do preventive or curative work among such a population, there will be needed not only an adequate medical service but a social service as well, an agency to find out the cases, advise and assist them to take advantage of the medical relief available, and to "follow up" the cases. In America, the National Society for the Prevention of Blindness has inaugurated a medical social service, which has, the writer understands, proved very effective in increasing attendance at the hospitals and securing needful continuity of treatment. If this sort of work is found necessary in advanced America, how much more we may imagine is it essential for any useful work of blindness prevention in the much more primitive countries of the East.

Considerations of this kind led to the formation in 1919 of the Blind Relief Association in Bombay. The first centers were opened in the Ratnagiri district in the same year, but for certain reasons the activity of these centers died out. At the same time a few centers were started by the Salvation Army in Gujerat and were financed by the Blind Relief Association. Lack of funds, however, prevented their continuance. Later on more money was raised and, although these centers could not be re-established, Blind Relief Associations were set up elsewhere on a more satisfactory footing. There are now Associations or Centers at Bijapur, Chalisgaon, Bulsar, Anand, Palanpur and Mirpurkhas (for Sind). Work was also opened last year in the Hyderabad State. Most of these associations have been working practically independently of each other, and have their own separate finances, but in 1929 the All-India Blind Relief Association was formed to affiliate the various centers, to consolidate them under one head, and finally to improve and extend the work of blindness prevention and relief.

Bijapur.—The Association at Bijapur was started in 1920, and based itself on the Government Hospital at that center. A system of village workers, known now as "field workers," was inaugurated. These men are given a training for three or four months at the hospital, and are then posted, each to a village or group of villages. Their duties are to compile and maintain complete registers of blind and partly blind people and sufferers from eye diseases in these villages; to send or bring in to the hospital all cases requiring operations or serious cases requiring treatment; to inspect newborn babies during the first ten days after birth for the detection of ophthalmia neonatorum; to maintain registers of all smallpox and measles cases; and to give treatment in the villages to simple cases of conjunctivitis or sore eyes. At the central hospital was stationed a special eye surgeon (an Indian) who was lent by the Government to the Association. At the present time the Association has two such eye surgeons, the second one being the General Secretary of the Association and responsible for the supervision and control of all the work of the village "field workers" in the district. The results are very promising. Before the Association started work in 1920 very little eye work was done in the district. In 1918 only seven eye operations were performed; in 1919, forty-three. In 1920 (the year the Association started work) the operations were 465, and they have steadily increased in number until in 1928 there were 1,991. Similarly with eye cases medicinally treated in the hospital and dispensaries in the district, the number in 1920 was 3,420, and in 1928, seven or eight years after the Association began its work, it was 19,352. The following table shows succinctly the figures:

BIJAPUR

	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Operations.....	7	43	465	461	634	894	1,168	1,264	1,702	1,866	1,991
Cases medicinally treated.....	3,420	4,780	7,820	9,693	9,006	11,922	14,248	12,294	17,300	19,452	19,352

At one time there were 77 "field workers" in the district but, owing to lack of funds and the necessary staff for supervision,

these numbers could not be maintained, a selection had to be made, and the Association now maintains 11 such field workers, each of whom has to work in a population of 70,000 or 80,000. The great need now is for the Association to be in a position to greatly increase the number of its field workers. Despite the reduction, however, the field workers in 1928 gave treatment in the villages in cases of simple eye diseases to 26,937 people—so that the total number of cases medicinally treated (at the Central Hospital, at the dispensaries and by the field-workers) was 45,289 against an average of 4,100 before the Association began its work in 1920.

The following are the figures for Chalisgaon, Bulsar, and Anand, the other centers established:

CHALISGAON

	1920	1921	1922	1923	1924	1925	1926	1927	1928
Operations*	4	..	42	961	7,584	3,212	4,831	5,792	9,992
Cases medicinally treated	276	2,039	2,720	4,042	3,232	2,982	3,908	4,266	4,519

*The figures for operations include minor operations, such as sub-conjunctival injections.

BULSAR

	1920	1921	1922	1923	1924	1925	1926	1927	1928
Operations	75	201	244	387	411	525	578	622	653
Cases medicinally treated	1,174	3,118	2,885	3,846	3,536	3,662	3,975	3,910	3,207

ANAND

	1922	1923	1924	1925	1926	1927	1928
Operations	142	165	205	35	23	41	47
Cases medicinally treated	800	1,266	3,158	1,482	996	795	996

Sind.—In Sind the system followed is to employ touring medical officers who visit villages, camp at various places and carry on their operations for a month or six weeks at a time and then move on to another centre. The Association in Sind has now two such touring medical officers, who between them work four districts of Lower Sind including the area known as the "Sind Desert." During 1927 and 1928, one of these touring officers, Dr. Sachanand, held 15 camps in different parts of Lower Sind, dealt with 11,947 patients and performed 1,939 operations.

Palanpur.—The Association was started here in 1928, and was not able to do much at first for lack of funds. It maintains, however, one touring medical officer and in the first six months of 1929, 1,784 eye cases were treated at the Hospital or in the area, and 504 operations done. During the monsoon of 1929, the Blind Relief Association medical officer for Sind (Dr. Sachanand) had to be deputed to Palanpur for two months, as Palanpur had lost its own medical officer and could not otherwise procure another. Dr. Sachanand held four camps in the Palanpur area and treated 4,000 patients and did 2,092 operations. This is a sample of the imperative necessity of ophthalmic relief—in this comparatively small area with a population of 206,467 no less than 5,788 eye patients were treated and 2,596 operations done in the eight months.

One of the most fruitful sources of blindness, especially blindness in children, is smallpox. In parts of Russia, we are told in a pamphlet entitled "Work for the Blind in Russia" by H. Jacob Kolonbovsky, the proportion of incurably blind people whose blindness is due to smallpox is 26 per cent. In Egypt, on the other hand, out of the thousands of eye cases examined by the ophthalmic staffs in 1912, only four cases of blindness from smallpox were found, and this was attributed to the efficacy of the public health regulations for vaccination and the enforcement of compulsory vaccination. In India there are no statistics of the proportion of blindness due to smallpox. But it is fairly certain that the proportion, particularly among blind children, is a high one. There is little doubt that if the smallpox patient is medically attended the risk of loss of sight can be effectively met by the proper measures. Lt. Col. R. H. Elliott of Madras writing on this sub-

ject in 1917 says: "I am not disposed to dispute that a certain number of cases of corneal trouble following smallpox may be due to local pustules, but I am confident that the vast majority of cases one sees in India which date their corneal trouble back to an attack of smallpox, are to be attributed to the results of exposure. The patient lies for hours or even for days on the floor of a dusty mud-hut, in muttering delirium or coma, with the eyes turned up; the lower part of the cornea and the adjacent conjunctiva are, consequently, exposed to the dessicating influence of wind, dust and heat and the insults of flying creatures of many forms, and this at a time when nutrition is at its lowest ebb." Such is the picture, only too true, of the conditions under which sickness must be undergone in the villages of India, and unfortunately most smallpox cases, certainly in the villages and even among the poorer classes in the towns, are medically unattended. But the visitation of smallpox cases is one of the main planks of the Association's preventive work. Every case of reported smallpox is seen, and unreported cases found out and a register is kept of visits made up to the time when the patient is either dead or definitely free from the risk of eye infection. Fortunately, in Bijapur, we have been able to obtain the co-operation of the authorities in reporting smallpox cases to our medical officers, and to smallpox has been added measles, which is also a source of serious eye infection. The same measures are taken for measles as for smallpox. It is much to be desired that the Government would add measles to the list of diseases which have to be registered and reported, and that the Health authorities everywhere would institute a system of visitation of smallpox and measles cases on the lines described. Lt. Col. Wright of the Madras Ophthalmic Hospital has recently stated that the control of smallpox would do more for the prevention of blindness than all the ophthalmic hospitals in India. But until the happy day arrives when vaccination has been made as effective in India as apparently it had become in Egypt in 1912, we must continue to strive to combat the results of disease which might be altogether prevented.

In the Bijapur district in 1928 field workers have visited with the greatest promptitude every village reported to be infected with smallpox or measles, and have actually treated 346 cases of small-

pox in which the eyes were affected in some way or another, and kept a watch upon all other cases. But, as will have been seen, it is not only in smallpox and measles cases that this watch is kept and "first aid" rendered. The child is inspected during the first ten days after birth for the detection of ophthalmia neonatorum, and in 1928, it is reported, 19 cases of ophthalmia neonatorum were detected and treated. Thereafter he is to be inspected at least once a month, if possible, up to the age of two.

It is hardly necessary to state that the village field workers who are trained by the Association's medical officers are under their immediate control and supervision. Every visit and treatment is registered, and it is the duty of one of the medical officers, who is General Secretary of the Association, to be constantly on tour, checking the registers in the villages and giving instructions for the more efficient control of the work. There is no eventuality which may lead to blindness, which is contemplated by the Association as outside the scope of its activities. The scheme aims at completeness, and though owing to lack of resources it may fall short of this, the system is there in essentials and may be seen working in the Bijapur district, with such results as have been shown in the figures given above.

It is obvious that the work of prevention and cure of blindness is capable of indefinite extension, not only in the Bombay territory but throughout British India and the States. At present only the fringe of the problem is being touched. It is, however, a question of men and money. It costs something like Rs. 16,000 ($6,000) a year to do anything effective in a whole district, even on the present scale. There are some 300 districts in India besides Native States. But from an economic point of view alone, quite apart from philanthropic considerations, prevention must pay. It has been calculated that in economic loss, blindness and partial blindness costs India some $65,000,000 a year.

The Nurse's Part in the Conservation of Vision*

Mary Ella Chayer, R.N.

THE public health nurse, in her dual rôle of conserver and educator of health, must interpret into terms of actual practice the findings and principles of health research. Her function in relation to the school is doubly important, since, teaching and helping both parent and child, she is aiding in the sight conservation work of three generations.

IT HAS often been stated that the most important measures for the conservation of vision are the detection and correction of defects, the treatment of eye disease, and the establishment of adequate educational facilities for those needing individual attention. As important as these measures are, they are after all remedial rather than preventive. True conservation consists in prevention of impairment rather than conservation of whatever vision remains after damage has been done. The school nurse should place her greatest emphasis upon helping schools and homes to provide that physical environment which shall best conserve sight. Parents and teachers should not only know what are the best physical facilities, but they should also form the habit of utilizing them to the fullest extent. From infancy to childhood, in fact all through life, there should be an unconscious response to the right environment, and a conscious response to the wrong environment. From the time a child is born his sight should be protected. If he responds only to the right kind of environment in childhood, the wrong environment will disturb his complacency and he will seek methods of restoring it. At present we find both children and adults using their eyes under all kinds of poor conditions and doing nothing about it. The result is that from twelve to twenty-five per cent of

* Presented at the Annual Conference of the National Society for the Prevention of Blindness, November 17, 1930.

school children have some degree of impaired sight, and practically all adults are wearing glasses after they reach middle life.

Tests of vision of school children reveal the fact that while some children enter school with vision defects, the number increases from grade to grade. It has also been observed that an impairment of vision can be brought about in a relatively short time. For example, after a certain elementary school was destroyed by fire, the third grade children were placed in a nearby church for schooling until such time as their building should be rebuilt. The church had beautiful stained glass windows which kept out most of the light. One month after these children had been placed in the church the nurse tested their vision and found that practically every child had a slight degree of impairment of vision, and over 50 per cent were found to have 20/40 visual acuity or less. The result of this examination was reported to the school administration, and steps were immediately taken toward securing a more adequately lighted room. After a period of four months the children were again tested and it was found that their visual acuity was about the same as that of other third grades of the city. One can only guess at the degree of injury which might have resulted had the children been kept in the poorly lighted room for a longer period of time.

So important is the conservation of vision in the earlier years that the school nurse should work with the public health nurses of the community to the end that together they may help parents and teachers to understand not only the importance of, but elements in good lighting. Many school rooms are still poorly lighted in spite of the effort, for years, to raise the standard of lighting for school buildings. And worse still, some buildings have facilities for proper lighting which are not utilized. It becomes the problem and function of the school nurse to make frequent surveys of school buildings with definite things in mind, such as: Is it possible for the room to be adequately lighted by natural lighting? If not, what arrangement for artificial lighting is probably best for the room? Is the teacher utilizing the opportunities which the room offers? If not, how best can the teacher be brought to appreciate her responsibility? Are the pupils aware of the wrong environment, and are they doing something about it? If not, how can

pupils be taught to conserve their own sight? Specific things which the nurse will notice when entering a room are:

1. Placement of windows. In general, window space should be at least twenty per cent of the floor space and windows should be near the ceiling, as the best light comes from the upper half.

2. Arrangement of shades. As is stated above, the best light comes from the upper half of the window. Two shades should be found on each window, hung in the center, so that the one rolls up and the other down. They should be carefully fitted to avoid cracks of light in the center and at the sides. If cracks of light are present, children should not sit at desks where the shaft of light is shining on the work. Especially in north rooms should the teacher see that the window shades are rolled to give the best light possible. Teachers often adjust shades at the beginning of the session and then become so absorbed in their work that they fail to make the necessary changes as conditions of light change. Teachers should form the habit of adjusting the shades at the beginning of each period and as necessity arises.

3. Arrangement of tables and chairs. In many schools, especially in elementary grades, tables and chairs are taking the place of the stationary desk and seat. This makes it impracticable to have light coming from the left side only. Care should be taken that the tables are placed so that the short side of the table rather than the long side is against the light. In this way children may sit on three sides of the table without facing the light. Care should be taken that children do not obstruct each other's light.

4. Size and character of the writing on the blackboard. Clear, distinct, large writing should be used on the blackboard. Boards should be dull gray or black, and should not be placed between windows. Studies are being made to test the effect of throwing the lower end of the blackboard out three or four inches, making it stand easel fashion. This would seem to be of advantage for avoiding glare.

5. Lighting on dark days. Some rooms are sufficiently lighted on bright days but are too dark for comfort on dark or rainy days. Such rooms should be artificially lighted and the best standards of artificial lighting maintained—namely about eight foot candles of light in all parts of the room.

6. Distance of the printed page from the eye. Children should hold books at the proper distance from the eye, which is from twelve to fourteen inches. Careful note should be made of all those who do not maintain this distance. They may have learned a bad habit which needs to be changed, or they may have an eye defect which needs correction. They should be sent to the nurse or physician for examination and they should, if the habit persists, be referred to the family physician, even though the school examination may not show any defect.

7. Check on children wearing glasses. Children wearing glasses should wear them regularly. Care should be taken that frames are not bent and that glasses are properly adjusted.

Another important step in sight conservation is the control of infections, by immediate isolation from the group of any children showing symptoms of disease, especially of those diseases which are likely to lead to vision impairment, such as measles, scarlet fever, etc. There should be careful removal of foreign bodies from the eye by someone who knows how to do it properly.

Next in importance to proper environment is a survey of all children to discover those who are in need of individual attention. There has probably been too much emphasis placed upon routine surveys and not enough attention has been given to the frequent checking of border line cases, and other cases which need individual adjustment. There should be a frequent check up of children whose visual acuity falls below 20/20. There should also be check up of children suffering from headaches and those having extra-ocular disturbances, such as frequent styes. It is of extreme importance that children who have been absent because of illness should have an eye examination soon after re-admission to the classroom. Their eyes may need to be especially safeguarded until such time as their general physical condition has been restored to normal.

Several articles have been written on the technique of testing for visual acuity, and it will not be necessary at this time to consider methods. Attention should be called only to a few points which are sometimes overlooked. To obtain comparable results from one test to the next it is necessary that the illumination of the eyechart be standardized. This can be done only by the use of artificial lighting. The 60-watt daylight bulb, properly adjusted, has seemed

to give the best results. It should be remembered that the child himself must stand in a good light with no glare, and at a distance of twenty feet. A fifteen foot range does not give good results because the Snellen charts are drawn only to the twenty foot range. The eye should be covered with a card which covers, but does not touch, the eye. Both eyes should remain open during the tests. The preliminary examination is made usually by the nurse, and she refers to the school physician all those who seem to present any abnormal condition. Many schools are inviting and urging parents to be present at the physical examination of their children. Their presence offers the physician and the nurse a rare opportunity to give them first hand information and to emphasize the importance of proper lighting facilities in the home, the lasting value of early correction of defects, and the elements that constitute an adequate eye examination. It is necessary to explain to parents the value of, and the reason for, refraction of the pupil. When they understand this they will seek an examiner who will give such an examination. Following the superficial examination made by the school, if any eye defect is suspected the physician refers the parents to the family physician for further advice as to what eye specialist should be employed. Correction of defects comes easily after this preliminary examination. If the parents are financially unable to employ an expert, arrangements may be made for such clinic service as the community affords.

In the rural communities, where the services of a school physician are not available, the nurse works directly with the parent, urging him to seek the advice of the family physician. The contact with the parent has often been made by home visits, but if the parent can be brought to do something, such as coming to the school for consultation with the nurse, this activity puts him in a more co-operative mood, places upon him a larger measure of responsibility and contributes to a greater degree to his education.

When the nurse is not able to visit the school sufficiently frequently to be of the greatest service in sight conservation, it is the teacher who is forced to assume the larger share of responsibility. The nurse must see to it that the teacher knows the elements of proper physical environment for sight conservation. The teacher should also know how to make vision tests. It will

be necessary for the nurse to pass on this information until such times as adequate instruction is included in teacher training courses. In some situations the nurse has helped the teacher by giving demonstrations of vision testing at county institutes and at other meetings of teachers. In other places the need has been met by carefully prepared bulletins giving explicit directions to teachers so that they have been able to learn by themselves to test for visual acuity and to detect deviations from the normal. The teacher may report conditions directly to the nurse, or she may consult with the parent and ask that the advice of the family physician be secured.

There are some children who need a special adjustment of the school environment before they can profit to the fullest extent by the offerings of education. State schools for the blind and semi-blind have been provided; public schools should have sight-saving classes for those children who cannot be properly educated under less favorable conditions. The nurse has a peculiar contribution to make to children in sight-saving classes. Admission to such a class should be made only on the advice of an ophthalmologist, who has a complete understanding of what the school means to accomplish by this type of class. The nurse needs to interpret the school to the specialist and, in turn, to interpret the findings and the advice of the specialist to the home and the school. There should be frequent follow up of every child in sight-saving classes. The nurse should know when the specialist wants to see the child and should lend her influence toward seeing that child and specialist are brought together whenever necessary. The child with a special handicap may be in need of a longer rest period than other children, or may need to spend shorter hours in the classroom. Teacher and nurse should give more intensive health supervision to these children, each one being treated as an individual. In addition, any child with a handicap is likely to present some degree of maladjustment to life. It is therefore important that these children be wisely guided. The advice of a specialist in child guidance should be sought in making adjustments which will include vocational adjustments compatible to his handicap. Curriculum changes may need to be made to fit the child for self-support. There should be a study of occupations which people with poor sight can pursue with success.

In conclusion may I say that the school nurse has a responsibility, shared with other public health nurses of the community, toward the education of parents in the conservation of vision from the earliest years; that the nurse in schools helps the teacher to utilize facilities offered for sight conservation, and to pay attention to changing conditions of light, to the end that there may result, on the part of the child, an unconscious response to the right environment; that an awareness of wrong conditions is necessary before taking steps with reference to correction; that routine surveys of eye conditions are of little value unless the results are used as a basis for meeting individual needs; that nurse and physician have a unique opportunity at the time of the physical examination to give parents a better opportunity to appreciate the importance of the elements in sight conservation; that in rural communities, where a larger degree of responsibility rests with the classroom teacher, the nurse must help the teacher to an intelligent understanding of this responsibility; that special provision should be made for a child who cannot adjust adequately to the regular school environment.

Spectacles in the Making

Gertrude Utstein

GLASSES have been used for centuries as an aid in seeing; their history shows many changes in styles and materials, but no change—except of more intensity—in the human desire for good eyesight.

LITTLE is known of the early history of spectacles before the thirteenth century; their origin is veiled in mystery, and it is only through Chinese legend that we know of their antiquity. Tradition has it that Cho-Tso, the "Old Man of the Mountain," who is supposed to have lived in China thousands of years ago, found pieces of rock crystal in dry beds of the beautiful sacred mountain streams and ground them into a pair of lenses with sand from the same streams. For frames he took the shells of the sacred tortoises.

Another legend concerns Confucius and a cobbler. Confucius left his shoes with the cobbler to be repaired, and on his return was surprised to be greeted by an uncomfortable cobbler and a pair of unmended shoes. The reason for this apparent lack of efficiency was due to the activities of the cobbler's wife, who in a fit of temper had thrown red pepper into the cobbler's eyes. Now, this unfortunate man had not only sick eyes, but crossed eyes as well. Confucius, so the legend goes, gave him a pair of spectacles which cured both the irritation and the crossed eyes!

Glasses in China were worn not only for visual defects, but for good luck, and for the relief of all sorts of ocular ailments. The Chinese still prescribe and wear brown and black crystals for diseased eyes, imagining them to be a direct cure. Spectacles served too as a badge of superior social status, and, as a result, frames were often worn without lenses to lend a mark of distinction to the wearer.

Crystals were undoubtedly used as a remedial agent in diseases at the time of Confucius and perhaps even earlier, but there is no evidence of their use for refraction until the thirteenth century A.D. As early as 2000 B.C. engravings were cut into onyx and other stones, and these mounted into rings. In some, the figures of men and animals are so fine as to make it obvious that the eye must have been aided by some magnifying agent. Among the ruins of Nineveh, Sir Henry Layard found a lens of rock crystal, plano-convex, 1½ inches in diameter with a focus of 4½ inches. This lens, the oldest perhaps in existence, is as expertly finished as a crystal edged in a modern machine. The invention of spectacles for refraction has been attributed by some to Roger Bacon, a professor at Oxford University, who described a lens for the correction of farsightedness. In Germany glasses are referred to in a collection of ballades between 1260 and 1284; and again in a manuscript of the year 1289 we find the passage, "I am so debilitated by age that without the glasses known as spectacles I would no longer be able to read or write. These have lately been invented, much to the benefit of poor old people whose sight has become weak."

In 1303 Montpelier, a French physician, told of using a magnifying glass for reading. Petrarch, the Italian poet who lived from 1304 to 1374, recommended eyeglasses for restoring weak sight. Our own Benjamin Franklin made the first double vision glass in 1784, and Thomas Young, an English scientist, described a lens for the correction of astigmatism in the year 1880.

The introduction of glasses was at first opposed by both priest and physician. Over the grave of a Florentine monk, to whom the invention of spectacles is more generally ascribed, is this inscription: "Here lies Salvino Armato Armati, the man who invented spectacles. May God forgive him his sin." The clergy regarded glasses as violating the divine law that disabilities should be visited upon the aged; and physicians, placing their faith in eye lotions, paid little attention to eyeglasses and even derided their use. Bartisch of Dresden, the most famous oculist of the sixteenth century, recommended an eye wash or the use of a massage, as did other physicians even down to the middle of the nineteenth century. Chinese physicians, however, were an exception. At the end of the eighteenth century nearly all of them wore spectacles

with very large, round glasses, as a means of identification in their profession.

Till the latter half of the nineteenth century the use of glasses was limited. It took time for social approval to be obtained, technical improvements to be developed and the principles of refraction established. Their need, moreover, was not felt as long as books were rare and education restricted to the relatively few. There is little doubt that the main impetus to their extended use was the invention of printing.

There was a rapid development of the spectacle industry after this time. The first makers are reported from Frankfurt-am-Main in 1450; from Strassbourg in 1466; from Nuremberg and Regensberg in 1473. With the development of spectacles as a commercial commodity in the fifteenth century, came the progress of spectacle guilds. The two principal guilds were those of Nuremberg and Regensberg, both in southern Germany. Venice, expert in the manufacture of glass, was another important center for the manufacture of lenses. In England, "The Worshipful Company of Spectacle Makers" was established in 1629, its first charter being granted by Charles I. As the industry grew and the manufacture of spectacles increased with the greater demand, the first makers became associated with other commercial bodies and were classified with them.

In a review of merchants and artisans which passed before Louis XI. of France in 1465, the spectacle makers marched under the banner of the haberdashers and upholsterers! In 1525 spectacle makers were joined to mirror makers, and when, in 1581, Henry III. of France renewed the "Patents of Mastership," the mirror makers, spectacle makers and toy makers were joined in one guild. After the suppression of the masterships, 200 years later, in 1776, and their reorganization in the same year, these craftsmen were reunited to the upholsterers, furniture brokers, gilders of leather, and embossers. It was only in 1770 that French workmen whose work was confined to spectacles and instruments of precision took on the name of "opticians" while yet remaining members of the community of craftsmen, and having the right to use their coat of arms.*

* *Some Notes on the History of Spectacles*—Llewelyn Andrews. Transactions of Lancashire and Cheshire Antiquarian Society, Volume XLII, 1925.

Spectacles passed through the "trials of probation to the triumph of approbation." The wealthy went to great lengths to secure the finest glass procurable—lenses from Venice, richly ornamented frames, and bejeweled cases. During the fifteenth century it became customary to picture with spectacles not only characters of dignity and importance, but saints and Fathers of the Church. The oldest known picture, one of Cardinal Ugeone, showing eyeglasses, was painted at Treviso in 1342.

In Spain, spectacles were worn as a mark of distinction in 1685. Their wearers were regarded, in high society, as possessing elegance, distinction, and even superiority. This is particularly interesting since in France, at a somewhat later period though at a time when glasses were still worn in Spain as a mark of distinction, it was not fashionable to wear them in good Parisian society. The Parisian concealed, rather than called attention to, defects and weaknesses of the eyes. It became a breach of etiquette to wear glasses, but the obvious need for them opened the way, in that country, for the use of *lorgnettes*, which were held in the hand and brought to the eye when their owner desired to scrutinize an object or a person whom he could not see with the unaided eye.

Glasses to assist vision were probably first made in the form of a magnifying glass which was used by monks and other learned persons to decipher manuscripts. This was a single lens, framed in bone, horn, wood, copper, iron or lead, with a handle attached. Apparently it was not until some time later that the idea occurred to someone to take two lenses with short handles, to pierce the ends of these handles and then fasten them together with a pin or nail. These could be placed on the nose, in front of the eyes. These riveted spectacles were used during the fourteenth and fifteenth centuries and even up to the beginning of the sixteenth century. They were heavy and clumsy, the frames being formed of two circles of copper, lead, wood or iron. No wonder that their clumsiness caused the common people to regard them as "inventions of the devil!"

Many amusing ways were tried to keep the glasses of the old pinned type or with a rigid bridge from falling from the nose. Some were sewn or tied to the bonnet or cap, and others were tied to the ears by ribbons or cords. It is interesting to note that the

early Chinese glasses were held in place by weights attached to cords running behind the ears! The Chinese exercised their ingenuity further by fastening a little vertical arm with a knob at the end of it to the center of the bridge, so that it could rest on the forehead and keep the glasses the correct distance from the eyes. With a further determination to keep their glasses on their noses, the Europeans later attached a vertical hinged piece to the bridge, which extended up over the forehead and then bent backwards through the hair or under the cap. In 1746 spectacles with hinged side pieces were first advertised by a French oculist as *lunettes à tempēs permettant de respirer à l'aise* (spectacles for the temples permitting one to breathe easily). Quite a comment on the early crude eyeglasses!

Another major objection to spectacles was removed by the ingenuity of Benjamin Franklin. He had been equipped with a pair of spectacles to aid him to see words and objects at close range. But he found that while he could see to read very well when he wore the glasses, objects even at a short distance away were in obscurity. He could not see anything at the other side of the room; the faces of those with whom he talked were blurred; he could not take a step with assurance. This was by no means a new condition. It had been a source of annoyance ever since spectacles came into use, but others had accepted the condition as irremediable and had submitted to the necessity of adjusting their glasses when they wished to see objects close at hand, removing them in order to see more distant objects.

Franklin set about to overcome this difficulty. "If," he reasoned, "I can see distant objects clearly with my eyes without the lenses, I should be able to see through a piece of plane glass with equal clarity." The conclusion then was obvious; he would have a portion of each rim supplied with a piece of plane glass and the remainder with a section of a lens of the focal power he needed to read with, and thus be able to see both far and near without having to remove his glasses.

With characteristic logic, having noticed that he raised his eyes when he wished to look away, and lowered them for the purpose of reading, he had the plane glass placed in the upper portion of each rim and the lens in the lower part. The invention was a

complete success. Thus the first bifocal came into being, which has since been followed by a slightly better looking cement variety, then by the invisible and nearly invisible double vision lenses.

The material of frames and the shape of lenses have always been a matter of taste and of fashion. Wood, ivory, bone, horn, copper, lead and leather, as well as gold, silver, tortoise-shell and celluloid, have been used. In the nineteenth century large, round lenses were followed in popularity by small, round lenses, which were, in turn, succeeded by octagonal, quadrilateral, square and oval shapes. In 1840 Waldstein of Vienna devised rimless spectacles, and by 1850 these with "riding bow" temples were in general vogue.

The first lenses were sections of quartz, which were used either to magnify or to aid the weakened sight of the old, and were generally in convex form. Beryl, an emerald of smoke color, was used in the Middle Ages for lenses, and it was from it that the French derived the names *bericle* and *vericle* which later became *besicle*, then *besicles*, the term now applied by them to the complete spectacle. It is probable that the Dutch derived their name for spectacles, *den bril*, from the same stone, and the Germans their name of *die brille*. Spectacle lenses of olden times were not only made of clear pebbles or glass, but were frequently of naturally tinted pebbles or of tinted glass, blue or green.*

As a protection from excessive light, lenses made of amber saturated in linseed oil were introduced in 1591. Colored glasses were soon substituted and various shades successively came into use. Chlorophyl-green was proposed in 1880 in the belief that the irritating effects of glare are due to ultra-violet rays; euphos (a greenish yellow glass) was introduced in 1907; and recently the Crookes lenses, produced by Sir William Crookes, have become popular. The Crookes lens is a protective glass so nearly colorless that it does not affect color vision.

A comparatively recent and increasingly important use of glasses is as a protection to the eyes of workers in hazardous occupations. As far back as 1870, individual workers in steel foundries, chemical plants and at emery wheels began to wear a heavy type

**Some Notes on the History of Spectacles*—Llewelyn Andrews. Transactions of Lancashire and Cheshire Antiquarian Society. Volume XLII, 1925.

of spectacle to protect their eyes from the molten steel, the splashing acids of the chemical vat, or the flying particles from the emery wheel. It was not until 1909, however, that heads of industry saw the necessity of equipping every worker in hazardous occupations with these protective goggles. The American Steel Foundries led the way; the other industries have been rapidly following.

The first goggles used for the protection of the industrial worker's eyes were of heavy crude glass, having the frequent disadvantage of distorting vision while protecting the eyeball. Tremendous improvement in goggles for all types of work have been made since the first realization of their value,—the most important perhaps being the use of indestructible glass. Although perfection has not yet been achieved in the design of goggles, the concerted effort of safety engineers, industrial leaders and the manufacturers of eyeglasses is actively focussed upon the problem of saving eyes in industry.

Editorials

Medical Social Service in Eye Clinics

MEDICAL Social Service in the hospital and the clinic is not very old in point of years but has long since proven itself indispensable. In many institutions the worker is a nurse, but her work is entirely different. At her best she is a sort of a liaison officer between the physician and some of his patients. Patients misunderstand directions, or fear operations, or become sources of danger to others because the overworked doctor cannot spend time in explaining, or arguing, or guaranteeing operative results. Others whose best interests perhaps require long continued treatment become discouraged and stop or flit from one clinic to another, wasting in each the time and the money required in making a new diagnosis, which has perhaps already been done several times. The worker keeps a file of patients who should return, and if they fail—sends for them or goes after them. She knows all about organized charity and can give advice and get assistance if needed. She is able to keep in touch with patients who have been discharged after treatment or operation, so that the physician and the institution can see at long intervals whether the results have been as successful as they seemed at the time of discharge. Her records make possible at any time a check, not only on the relative value of operations and treatments, but also in the relative results of different physicians in the same institution and of different institutions in the same field.

The profession is so new that there is as yet no absolute agreement as to just what her background and training should be—whether she would be more valuable with or without a preliminary training as a nurse—but at least she must have a training in office management and the keeping of records. She must have at least an intelligent though not a profound knowledge of many diseases and the purpose behind the treatment or operation. She must know all the ins and outs of organized charity and have a fundamental knowledge and experience in social case work. Above all,

she must be well educated, forceful, sympathetic and persuasive, and able to keep her position between physician and patients automatically and unconsciously. She must not be so subordinate that she is reduced to a mere errand girl for a masterful chief, nor so opinionated as to have independent ideas as to disease and treatment of patients.

There have been relatively few social workers in eye clinics and hospitals—some of them nurses, some trained social workers, and some untrained but educated and enthusiastic amateurs, but none of them trained for this special work.

In 1930 this group formed a national organization for which the National Society agreed to act as a secretariat permitting the exchange of information and experience through bulletins and correspondence as a substitute for the formal training.

To meet the needs of the local group in New York, the Society assisted in arranging a series of conferences in which some twenty-eight ophthalmologists discussed various eye conditions, especially as regard their social aspects, and other meetings conducted by the social workers themselves with the idea of promoting interest and discussing methods. These meetings have been most successful and it is hoped that they may stimulate similar efforts in other large cities.

For over twenty years the Massachusetts Eye and Ear Infirmary has been developing its efficient and well trained group of social service eye workers, which Dr. Derby, the institution's medical director, believes to be the greatest single advance in prevention of blindness of this generation. So much impressed has the National Society been with the character and scope of the work that for several years it has furnished, at Dr. Derby's suggestion, a social worker who devotes her entire time to that *bête noir* of ophthalmology, chronic glaucoma. With her help he has been able to keep under observation at regular intervals more cases than any one would have believed could be found in any one community, and seems to have demonstrated that every eye hospital of any size must adopt a similar plan, not only regarding glaucoma, but many other diseases where delay is fatal.

So convinced has the National Society become of the value of this work that it is now granting scholarships to a number of carefully

selected young women, who are to be trained at the Massachusetts institution and afterwards placed in other strategic hospitals in various parts of the country, where it is hoped each will be able to organize a department of social eye work and in time train other workers in their turn.

The interest on the part of institutions has been greater than was expected, all the present class having been spoken for long in advance of their graduation.

Our Society expects to watch carefully the progress of the experiment, and in some instances has even agreed to underwrite a portion of the salary for a limited period.

ELLICE M. ALGER, M.D.

What is a Sight-Saving Class?

To old friends of the forward movement for preventing blindness and conserving sight the sight-saving class is a familiar part of many of the more advanced school systems. To new friends it is often a revelation. To both old and new it must ever be a widening and deepening of opportunity, keeping pace with modern ideas and modern progress.

And just what is this opportunity that calls itself by so strange a name as a "sight-saving" class? It is a doorway opening into the world of education and of future possibilities for children who, because of serious eye difficulties that cannot be corrected or cured, are misfits in regular grades; children who need special educational keys to unlock this door—books in a type that they can see, excellent lighting, hygienic seating and, above all, the care of a trained teacher who understands their difficulties and is able to help them to overcome their handicaps.

But there is something illuminating about this door; it opens both ways. It not only leads into a special classroom where all educational media are adapted to the needs of the partially seeing child, a classroom where he may carry on all work requiring close use of the eyes without eye fatigue, but it also opens outwards into the regular grades where, with companions of his own mental age, he may take part in all activities not requiring close use of the eyes. Sometimes eyes improve so much under this care that their owners can stay on the regular grade side of the door for all their work.

Sometimes the opportunity demonstrates that children often considered backward or sullen or self-centered are, after all, as bright mentally, as sweet tempered and as socially minded as their companions, now that they can see something of the world about them and appreciate their relationship to it.

And who are these children who may use this special gate to open the door of opportunity? They comprise a small number; in some communities one child in a thousand, in others all the way down to one in two hundred and fifty. The amount of eye work that each may undertake is determined by an ophthalmologist. Oral instruction is emphasized. These children are able to compete with their normally seeing companions because of the special arrangements made for them, and, with very few exceptions, they follow the same curriculum. Naturally, for so small a group, one class may serve several schools or in some cases a community. Hence a number of grades may be represented and the teacher is able to care for a much smaller number than that found in the regular grades, where the children form a more or less homogeneous group.

The teachers of the first sight-saving classes had to blaze their own trail, but in the present day the way is made easier for those coming into the field. Universities and teacher training institutes in various parts of the country offer courses of training, sometimes during the regular school year, but more often during summer sessions. In the summer sessions of 1931 four universities will offer this special opportunity—Tulane University, New Orleans, Louisiana, June 15–July 24; University of Chicago, Chicago, Illinois, June 22–July 24; State Teachers College, Buffalo, New York, June 29–August 27; Teachers College, Columbia University, New York City, July 6–August 14.

There are now 375 sight-saving classes in the United States, representing 105 cities and 23 states. Among these there is a goodly proportion of junior high school classes, but only a few cities have made it possible for senior high school students to carry on their work under the best conditions. The experimental stage of these classes is past. They have demonstrated their right to exist, but greater efforts must now be made to enable them to meet the more diversified needs, both urban and rural, of the modern generation.

WINIFRED HATHAWAY

Note and Comment

Prevention of Blindness in Poland.—Blindness, caused by lack of proper medical care, or by medical care applied too late, is unnecessary. After the renationalization of Poland, a survey of ophthalmic resources, according to a report on "The Blind in Poland," was found to be extremely insufficient, with only 150 ophthalmologists to serve a population of 22,000,000 people. Since the war, the Polish government has increased the facilities for caring for diseased eyes, and special work against trachoma has been inaugurated. Schools, which have been growing rapidly since the nationalization, are built with the standards of eye health in mind, and part of the building code for new buildings provides for proper lighting for factory and office workers. Propaganda and educational projects are aiding in the attempt to prevent blindness.

The report published by the Organizing Committee of the Polish Delegation to the World Conference on Work for the Blind concludes: "In spite of all these efforts, the Polish Society for the Prevention of Blindness has far to go before it reaches the efficiency of the Society in the United States, where the activity has been aided for many years by contributions from interested private sources. The formation of the International Association for the Prevention of Blindness has encouraged the formation of a Polish Society, whose function will be to contribute to the activity of prevention of blindness in Poland and generally improve health conditions in the country."

Trachoma, a World Problem.—Issued from the Press of the Royal Hungarian University is a pamphlet reprinting the lectures given by its professor, Dr. Emile de Grósz, in his recent visit to the United States. Of particular interest was his lecture before the American Academy of Ophthalmology and Oto-Laryngology, Chicago, as president of the International Anti-Trachoma League, on the spread and control of trachoma. The widespread occurrence of trachoma all over the face of the civilized world, its disastrous results, both socially and economically, demand a national and international crusade on the part of all nations.

Among the difficulties which face this fight against the enemy of eyesight is the fact that it is not always possible to diagnose trachoma. The cause of the disease, too, has yet to be authenticated, and while it is undoubtedly infectious, whether it is the bacillus granulosis, the chlamydozoon or the gonococcus, or some now unknown organism which spreads it, is not yet known. But we do know that trachoma spreads, and spreads quickly, through families, communities, and countries. Lack of culture and poverty seems to accompany its growth, for it is more prevalent in those centers where there are found poor living conditions and poverty than in centers where cleanliness and hygienic knowledge are more usual.

Dr. de Grôsz recommends for the crusade, on the part of nations and international leagues, these measures:

(1) Reporting of all cases of trachoma, and frequent census of the trachomatous population through samplings of school children, army recruits, hospital patients, etc.

(2) Defensive treatment in infected areas, by instruction to local doctors and the use of travelling clinics.

(3) Central authority to regulate trachoma battles.

(4) Isolation of cases, in hospitals, clinics, schools.

(5) Instruction of all medical students in the treatment and diagnosis of trachoma.

(6) International co-operation.

(7) Continuous research into causes and treatment.

Poor Lighting the Cause of Accidents.—About 3,450 deaths and 450,000 injuries, or about 15 per cent of all accidents, are traced directly to poor lighting, according to the Committee on Light and Safety of the Illuminating Engineering Society. The high cost of compensation, and the additional eighty per cent loss in overhead charges, may be eliminated by installation of adequate lighting systems and keeping them in condition.

Connecticut Ophthalmia Neonatorum Figures for the Decade.—Annual reports of the State of Connecticut Board of Education for the Blind, 1929–1930, indicate that ophthalmia neonatorum, once the cause of many cases of blindness which were presented to

schools for blind children, is rapidly vanishing in Connecticut's schools. This is being accomplished through the enforcement of the law of 1921, which made compulsory the reporting of all cases of eye infection in infants, and the administration into the eyes of all babies born in a state institution, or under the care of a midwife, the sight-saving drops of silver nitrate. In the nursery for the blind at Farmington there have been no new cases of ophthalmia neonatorum since 1921. In the elementary school for the blind the number of new pupils blind from this cause has decreased to a lesser extent, but during the past biennial only one new case has been admitted.

The conservation of sight program of this organization continues to increase in scope. In the vicinity of Hartford, 216 children with serious visual defects were discovered in a survey of the sight of the school child. Recommendations have been made to establish a sight-saving class and to obtain a full-time worker to aid the regular public health nurses in their survey of the health of the district. This eye worker will also undertake to spread knowledge of eye hygiene and protection.

Prevention of Blindness in Missouri.—The Missouri Commission for the Blind trace, in their biennial report for 1929–1930, the development of prevention of blindness activities from 1915–1930. Although lack of funds seriously handicapped the prevention of blindness division and conservation of sight work during the first ten years, a gratifying progress in preventive work has been made in the past five years, and especially during the past two years.

A revised blind pension law demanded that any person receiving the pension benefits consent to undergo any operation which, in the opinion of the clinic, would cure him of his blindness. This law has materially decreased blindness.

With the first sight-saving class, started in Kansas City, began the active campaign for the conservation of vision. With the help of the National Society for the Prevention of Blindness, demonstrations of preschool eye testing were made and this work inaugurated. Since January, 1929, with a separate department in the Commission for the conservation of vision and the prevention of blindness, diagnostic and operative clinics have been opened, vision tests

have been inaugurated in schools and community groups, and social service workers and trained nurses have been added to the staff.

A special project which has recently been undertaken is an investigation into the causes of blindness. Among adults, the principal causes are trachoma, cataract, optic atrophy, cornea ulceration and glaucoma. Among the younger blind patients, ophthalmia neonatorum, optic atrophy, and congenital cataract lead the list. A survey as yet incomplete of causes of eye trouble shows that among the patients of the clinic refractive errors are the most usual cause for consultation, while trachoma, cataract and glaucoma follow in frequency.

Joseph A. Stucky, M.D., 1857–1931.—As the SIGHT-SAVING REVIEW goes to press the National Society learns of the tragic death of Dr. Joseph A. Stucky, of Lexington, Kentucky, zealous worker for many years in prevention of blindness. The members of the Board of Directors of the National Society passed the following resolution lamenting the death of their co-worker:

"In the annals of his native state, Kentucky, there can have been no kindlier or more helpful spirit than that of Dr. Stucky. Were it possible for this body to confer upon him a degree worthy of his service, it would be that of doctor of humanity, for he combined with his art of healing a rare sweetness of personality and an eagerness to be of help that endeared him alike to the humble folk of the Kentucky mountains and to the world's favored citizens.

"To open the eyes of the blind; to unstop the ears of the deaf, this was the mission that earned for him among a stern mountain people, little given to terms of endearment, the name of Beloved Physician.

"In the minds of those who knew him or his work, he will always be the Beloved Physician, to whom the greatest reward of service was ever the opportunity for greater service."

Commenting on the loss of Dr. Stucky, Dr. Park Lewis, Vice-President of the National Society, paid this tribute:

"It has rarely been my good fortune to come in contact with a gentler soul. His was indeed a life devoted to ameliorating the woes of humanity.

"It is now nearly twenty years since my attention was directed to the splendid work which Dr. Stucky had been accomplishing among the

suffering people in the mountains of eastern Kentucky. Some of these victims of trachoma had drifted down to the hospital in Lexington, of which he was the ophthalmic surgeon, and the piteous condition not only of their eyes but of their circumstances strongly appealed to his sympathies. He made a tour of inspection on the occasion of his next vacation into this hinterland. The conditions that he found there so moved him that, with an assistant and two nurses, he made excursions beyond the limits of urban life and spent his vacations in treating, advising and helping these native Americans.

"He found them, as he often said, unlettered but not unlearned. They were the backwash of the Revolution and for the most part bore good old Anglo-Saxon names. It was from this tribe that Sergeant York came.

"Dr. Stucky found them living in huts that could scarcely be called shelters, with four windowless walls, the only opening being a doorway. Through his efforts the federal government later made it a part of its program to establish movable hospitals for the care of these people, when it became evident that the labor was far greater than any individual could accomplish.

"On the invitation of Colonel John McMullen, I made a visit to this district, and rode with him from Jackson, in Breathitt County, up the dry streamways, up the arroyos, far beyond the point at which the railroad ended. There I saw with my own eyes the magnificent work that was being done for these suffering people and the supreme efforts that they themselves were making to secure the assistance.

"Some of them, I was told, walked forty miles to receive treatment for their blinded eyes. One, I remember, was pointed out to me—a bright, clever looking young man who had been wholly dependent because of his blindness, but, having been cured, was self-supporting, self-sufficient and an effective member of the community. This was typical of the work that was done there. Not long since, Dr. McCormack, the health officer of the state of Kentucky, told me that some of these counties that had been what were termed 'pauper counties,' dependents upon the bounties of other parts of the state, had become wholly self-supporting, had established schools, had built houses instead of huts, and had indeed become assets instead of liabilities upon the common community.

"These results came almost entirely through the initiative of my dear friend, Dr. Stucky, whom we have in memory. His was a great life, an inspiration and a stimulus to all with whom he came in contact. Always buoyant, ever hopeful, as someone has expressed it, 'he went through life on tiptoe to the end.' I believe that all with whom he came in contact must feel, as I do, enriched from the wealth of such a friendship."

Decrease in Blindness in New York State.—According to a recent *Social Welfare Bulletin*, there has been a notable decrease in blindness in New York State during the past ten years, the figures dropping from one per thousand of the population to one per fourteen hundred in 1930.

International Trachoma Prize.—As part of the international effort to find the cause of trachoma, the Hungarian Minister of Public Welfare and Labor offers a prize of 2,000 Swiss francs for original work in the etiology of trachoma. Original or published work may be submitted not later than June 30, 1931, to the Eye Clinic No. 1 of the Royal Hungarian Peter Pazmany University, Budapest. Mr. A. F. MacCallan, Dr. Victor Morax, Professor L. Maggiore, and Professor Carl Prausnitz will serve as judges.

Ophthalmia Neonatorum Campaign in Pennsylvania.—That Pennsylvania state health authorities are waging an active battle against preventable eye infections and blindness is seen from the following letter, sent to all county medical society presidents:

Harrisburg, Pa., April 22, 1931.

My dear Doctor:

We regard this as an opportune time to bring before the medical profession of this state a matter which continues to be, as it has long been, a discredit to us as physicians, and an indictment against our social sense. I refer to the failure to carry out provisions of the law regarding the use of a prophylactic in the eyes of the newborn and the due reporting of all cases of "sore eyes."

Every year enough blindness is occurring among babies as a result of ophthalmia neonatorum to rank us among the worst of the states. To allow this state of affairs is a crime against the child primarily and against society as well.

A case of gonorrheal ophthalmia has recently occurred in one of our western counties, where the baby narrowly escaped losing both eyes, and only prompt action on the part of the Sight Conservation Service in the Council for the Blind prevented the worst results.

There are at present in the Overbrook School for the Blind 289 pupils, 51 of them there as a result of ophthalmia neonatorum. There were 45 new entrants last year, and 6 of these were blind from ophthalmia neonatorum.

The use of prophylactic in the eyes of the newborn is mandatory. Sore eyes are reportable. No eye need be lost if proper treatment is given, and prompt reporting is the only way to secure adequate official attention.

I wish to appeal to you to bring this before your County Medical Society once more, in such manner as to arouse interest in the observing of the law. If the attendance is not such that all your members hear the notice at the meeting where the matter is presented, will you be good enough to communicate with the absentees, either sending them a copy of this letter or some other effective message?

The Department is deeply concerned to have this law obeyed and is prepared to enforce it, carrying cases into court if necessary.

Fraternally yours,

THEODORE B. APPEL, M.D.,
Secretary of Health.

World Conference on Work for Blind.—The first World Conference on Work for the Blind was assembled in New York City from April 13 to 17. More than 100 delegates from thirty-seven countries as widely scattered as South Africa, Australia, India, Japan and Denmark were present. A large number of the delegates were blind. The World Conference was almost entirely devoted to welfare work for those who are already blind, and exchange of views and opinions were held on many important subjects. The outstanding achievement of the Conference was the formation of a permanent international council for the blind whose headquarters will be in Paris. All interested in the prevention of blindness welcomed the formation of a World Council for the Blind which will, in all probability, work in close co-operation with the International Association for the Prevention of Blindness. which was organized in Scheveningen, September, 1929, which also has headquarters in Paris, 2 Avenue Velasquez.

The ten days following the New York Conference were spent by the foreign delegates in a visit to the cities of Philadelphia, Washington, Pittsburgh, Cleveland, and Boston. In Philadelphia a number of ophthalmologists who were delegates of the Conference visited the Wills Eye Hospital and were guests at a luncheon tended them by Dr. William Campbell Posey. In Cleveland, much interest was manifested among the delegates in the sight-saving classes. In Boston, the delegates who visited the Massachusetts Eye and Ear Infirmary were manifestly impressed with the medical social work carried on in that institution in co-operation with the National Society for the Prevention of Blindness.

Among the ophthalmologists present at the New York meetings and on the trip were Dr. Zahor of Czechoslovakia, Dr. el Kattan of Egypt, and Dr. Merida Nicolich of Spain. The National Society welcomed the opportunity to be of service to the delegates interested in the prevention of blindness, feeling that in this way co-operation was extended with the International Association for the Prevention of Blindness.

Current Articles of Interest

Good Lighting—A Safety Efficiency and Economic Measure, *Safety Engineering*, April, 1931, published monthly by Safety Magazine Publishing Company, New York, N. Y. The demands of safety, efficiency and economy to the worker and the owner require special attention to the lighting fixtures. Even where natural light is usually good, sunless days and rain require the supplementary aid of good lighting fixtures.

Lighting systems are available for all types of work and conditions but care of these reflectors and bulbs is important for the optimum efficiency of the lighting system. Cleanliness of the bulbs and reflectors is vital. Where lamps are inaccessible for ordinary cleaning, a device has been put on the market that permits the cleaner to lower the lamp to the floor and return it in place. This device is adapted to any kind of support and any kind of lamp. Protecting lamps from vibration is important in the efficiency and economy of the plant. Another device which stabilizes fixtures against even the slightest vibration is manufactured by the same company.

Men Must See Well to Work Well, G. M. Briggs, *National Safety News*, May, 1931, published monthly by the National Safety Council, Chicago, Ill. At the annual Congress of the National, Safety Council one of the most important meetings was devoted to the subject of conservation of the workers' eyes. Facing the graveness of the figures for the past few years, in the number of workers whose eyesight was either seriously impaired or completely destroyed, the Council urged the adoption of measures to aid in the protection of the eyes of industry. A thorough examination of the worker's eyes as he enters work, as well as periodic examination at intervals afterward, will prevent men with serious visual handicaps from undertaking hazardous occupations. The provision of adequate safeguards, in goggles and clothing, will prevent accidents to the eye in occupations where these are likely to happen. In some plants, the workers at emery wheels, chemical vats and about the steel cauldrons are provided with goggles and masks;

in others, every one, no matter what his occupation, must wear goggles in the plant, to protect his eyes from the unexpected accident.

The exhibition, upon the bulletin board, of goggles which have been pierced or shattered, reminding the workers of eyes which escaped probably fatal injury, is a most pointed method of teaching men the need of wearing goggles. In the 583 plants which cooperated with the National Safety Council and the National Society for the Prevention of Blindness, 7,411 workers escaped partial or complete damage to their sight, saving millions of dollars to employers in compensation and replacement, and as many more to employees in wages.

Golf, Glasses and Glare, Henry L. Langworth, *Hygeia*, May, 1931, published monthly by the American Medical Association, Chicago, Ill. A timely hint to golfers, as well as others who find that playing games in the open air and sunshine does not always bring them the great physical benefits which they expected, is this article, stressing the need for eye examinations as a regular part of health routine, and the advantages of protection from the strong rays of the sun while enjoying its undisputed benefits. Hats, eye shades or lightly tinted glasses would remove the dangers of strain from glare and increase the value of this form of out-of-door exercise.

Has the Navy any Ophthalmic Sequelæ? F. C. B. Gittings, M.D., *Journal of State Medicine*, April, 1931, published monthly by the Royal Institute of Public Health, London, England. With the possible exception of trachoma, there are no cases of blindness among men in the Royal Navy which may be laid to the hazards of service. Of the many cases of eye trouble and strain which have been reported, none of them could be said to be the result of service; in the navy, as in civilian life, the eye undergoes changes in refractive ability.

The Protection of Eyesight in the Factory, F. de Lapersonne, *Review and Information Bulletin of the League of Red Cross Societies*, January, 1931, published monthly by the League of Red Cross Societies, Paris, France. The author presents the status of eye hazards in industrial occupations in France, pointing out that the frequency of eye accidents is particularly high in the metal

industries; where flying sparks or filings enter the eye there is a fifty per cent chance of permanent blindness. He points out the danger of careless treatment for a foreign body entering the eye, emphasizing the necessity of having the particle removed under sanitary conditions by trained experts rather than by fellow workmen. Some of the measures he suggests to reduce the hazards in industry are the wearing of goggles and protective devices; the examination of the eyes before employment; the early treatment of infections of the lacrimal tract, eyelids and conjunctiva; adequate natural and artificial lighting to prevent accidents and avoid eyestrain; and a securing of the intelligent and wholehearted cooperation of the employees in utilizing safety provisions.

The Laboratory Passes Judgment, Marcella Carter, *Hygeia*, May, 1931, published monthly by the American Medical Association, Chicago, Ill. The author, a laboratory technician, by giving interested attention to her work, in spite of temptations for doing a routine job, tells how she received her reward when she heard that, on the strength of her extra care, a baby was saved from blindness and another child got its chance for sight.

A Program for 100 Per Cent Eye Protection in Industry, Louis Resnick, *Safety Engineering*, April, 1931, published monthly by the Safety Magazine Publishing Company, New York, N. Y. Author describes the formulation of a self-appraisal for safety engineers and other executives concerned with the protection of the eyes in industry undertaken by the National Society for the Prevention of Blindness. The appraisal questionnaire should help safety engineers see just how near they stand to protecting the eyes of the workers to the fullest extent, and stimulate them to increasing industrial protection. The questionnaire dealing with the plant, the worker, and the job is still in the process of development and the National Society for the Prevention of Blindness would welcome any suggestions and criticisms for its improvement and utilization. Only the plant which can answer each of these questions in the affirmative can be called one hundred per cent perfect in eye protection.

National Society Notes

AT THE last meeting of the Board of Directors of the National Society, the following were appointed as members of the Board of Directors: Miss Mary Antoinette Cannon, New York School of Social Work; Dr. A. B. Meredith, Professor of Education, New York University; and Dr. John M. Wheeler, Professor of Ophthalmology, Presbyterian Hospital, New York City. Dr. Meredith until recently served on the Advisory Committee of the National Society and is a member of the Board of Editors of the Sight-Saving Review.

The National Society accepted with regret the resignation of Mrs. Corinne Roosevelt Robinson as a member of the Board of Directors and appointed her as one of the honorary vice-presidents in recognition of her years of interest and activity in the National Society.

* * *

At the request of the New York Tuberculosis and Health Association, staff members of the National Society talked over the air on some of the aspects of conservation of vision. Mr. Lewis H. Carris, managing director, spoke on "Eye Safety in Childhood"; Dr. B. Franklin Royer, medical director, talked on "Babies' Eyes 'Neath Summer Skies"; Mr. David Resnick, director of publicity, discussed "Eyes in Athletics"; Miss Eleanor P. Brown, secretary, gave a short talk on "Making the Eyes Bright for School." Mr. Louis Resnick, director of industrial relations, was requested to speak on "Opportunities for Saving Eyes in Industry," by the Labor Union Safety Committee appointed by Governor Roosevelt. Although the National Society has no regular time on the air, through its co-operation with other organizations its message reaches many thousands of the "unseen audience." Other sight conservation talks will be given by the Society during the summer.

* * *

On a trip which extended over two months, Miss Mary Emma Smith, director of nursing activities of the National Society, visited

centers of South Carolina, Georgia, and Louisiana, demonstrating materials and methods of preschool vision testing before Parent-Teacher groups, public health nurses, student nurses and teachers-in-training. A special visit was made in Savannah, Georgia, during the Conservation of Vision Week, April 20–25, when Miss Smith joined Dr. Royer in assisting the Georgia Association of Workers for the Blind in their state-wide campaign for saving sight. At the Convention of the National League of Nursing Education, held in Atlanta, May 7, Miss Smith led a round table discussion on conservation of sight at which Dr. Royer read a paper.

* * *

As representative of the National Society for the Prevention of Blindness, Miss Eleanor P. Brown has made several visits to Boston to participate in the course of training for medical social service workers in eye clinics supervised by Miss Amy G. Smith at the Massachusetts Eye and Ear Infirmary, under the auspices of the Committee on Training Medical Social Workers for Eye Service. The course, from April 1 to July 1, is the first of its kind to be undertaken; other courses will follow during the coming year.

* * *

Mrs. Winifred Hathaway, the associate director of the National Society, has made short visits to Chicago and outlying centers, to South Bend, Indiana, and Detroit, Michigan, as well as to Buffalo and Syracuse, New York, to help solve through her broad knowledge of the field the problems of sight-saving class teachers and supervisors in those localities. During the summer, Mrs. Hathaway will give the course for training sight-saving teachers at Teachers College, Columbia University, New York City, and is on the staff of special lecturers of the University for the summer session.

* * *

The National Society was represented at the World Conference on Work for the Blind, held in New York from April 13–19, by Mr. Carris, Mrs. Hathaway, and Dr. Royer. Interested in all of its

sessions, the staff members of the National Society participated most actively in the round table conference on "Prevention of Blindness and Saving Sight," led by Mr. Carris, after a special session devoted to the prevention of blindness, at which Mrs. Hathaway read a paper on "Sight-Saving Classes."

Book Reviews

THE MOVEMENTS OF THE EYE IN READING. By M. D. Vernon. No. VIII. Reports of the Committee upon the Physiology of Vision, Medical Research Council. London: His Majesty's Stationery Office, 1930. 45 p.

A recent study of eye movements in reading comes from the psychological laboratory of the University of Cambridge. In this investigation the author has set up an apparatus which differs in some respects from the kinds of apparatus for measuring eye movements which have been used in America. The diagrams of the apparatus, which are given on page 8, will be of interest to the technicians in American laboratories. The use of prisms for deflecting the beam of light has made it possible to place the camera considerably above the level of the eyes, which permits the selections being read to be placed below the camera. The focussing devices are quite simple and the timing device is operated by a clock-work marker. The speed of the film is not given except for the statement that it "was not great enough for the accurate measurement of the duration of individual movements and fixations" (Page 10). This seems to the reviewer to be a very marked limitation of the apparatus, since the interpretation of reading records frequently hinges upon the possibility of plotting in detail each of the fixations.

The experiment conducted by Miss Vernon consists of two major parts. First, a series of records was taken of the voluntary movements of the eyes from point to point, with the intervals between the points ranging from shifts of five degrees to twenty degrees. The subjects also were required to fixate steadily for a period of twenty seconds each on a series of points on a screen. Supplementing this rather formal measurement of eye movements a second series of records was taken of the reading of various types of material. Samples are not given of the materials read, which makes it impossible for the reviewer to know just what was used. In view of the fact that the film moved too slowly to record the time of the different fixations separately, the basic data for the

study are given in terms of reading time per line in seconds and number of regressive movements per line. The reading time per line could have been figured equally well by much simpler methods than photographing eye movements, so that the only contribution of the technique was the measurement of regressive movements.

Only nine subjects were used in the entire investigation, eight of these being graduate students in psychology and one being a man "with some knowledge of psychology but with less education and practice in reading other subjects."

Records were also taken, following the reading, of the introspection of the subjects, particularly as related to affective and connotive reactions. These introspections were later compared with the objective data from the photographs of eye movements.

A number of conclusions were stated by the author with which the reviewer can hardly agree. For example, on page 34 the statement appears that "the number and duration of the pauses were, on the whole, inversely proportional." This relationship is very rough even for the nine subjects which the investigation covered, but data from the Chicago laboratory would lead the reviewer to believe that the relationship between these two functions is much nearer a zero correlation than the negative relationship which was described. On page 35 there appears a statement, "with certain exceptions inaccuracy of voluntary movement and of return movement in reading and unsteadiness of voluntary fixation are correlated with short movements and fixation pauses in reading, and that accuracy of voluntary and return movement and steadiness of voluntary fixation are correlated with long movements and fixation pauses in reading." The data presented from the limited group of subjects are far from convincing on this point. This is particularly true in view of the fact that the steadiness of a voluntary fixation is conditioned very much by the center of attention; that is, if a subject is asked to focus a dot for a given period of time, as in the case of this experiment, frequent oscillations in the fixation will always be apparent, but if a subject is adding a column of digits in arithmetic, where the attention is focussed upon the central processes rather than the perceptual processes, one will find fixations with absolutely no variance for eight seconds or longer, a type of eye reaction which the reviewer has never observed in any study of reading.

In the general conclusions Miss Vernon disagrees with the rather generally accepted fact in America that "the rate of reading is a function principally of training and of the habits acquired by use, and that the most rapid and regular reading was shown by the mature reader with fairly easy material, when he was attending to the content" (Page 42). Miss Vernon proposes that the emotional factors and interest factors which govern the reader are of greater importance. There is no doubt that with either training and maturity held constant or emotion and interest factors held constant variations in either set of factors will influence the reading. The conclusion which Miss Vernon has drawn is primarily on introspective evidence from the nine subjects used. Before modifying the general view which was previously referred to the reviewer would like to see a much larger body of objective evidence to support the introspections which were given. Furthermore, with any given type of material, different degrees of training and habit show regular gradations from the stage of beginning to read to mature reading. The fact that at any particular level of reading ability increases in number of regressive movements will result from changes in the degree of interest or purpose which motivates the reader, in no sense obliterates the fact that maturity in reading may be measured by changes in the number of fixations and regressive movements per line and in the duration of fixation pauses.

The study is one which any student of eye movements should read. The small number of cases makes a decided limitation in the importance of the conclusions which are drawn, and an extension of the experiment should certainly be made with children of various ages.

G. T. BUSWELL

SOCIAL WORK YEAR BOOK, 1929. Fred S. Hall and Mabel B. Ellis, editors. New York: Russell Sage Foundation. 600 p.

The *Year Book* is the first publication in which a compilation of organized groups engaged in social work in the United States has been attempted, and includes a descriptive roster of national agencies. It merits the attention of those concerned with prevention of blindness and conservation of vision in so far as any group

directly responsible for furthering a program to prevent blindness soon confronts problems closely allied to the field of other social work organizations. Success in any specialized field depends upon how wisely and how well existing agencies are used and activities are dove-tailed.

Some of the topics discussed in the *Year Book* which might well be studied in their relation to prevention of blindness and conservation of vision are Industrial Accidents, Safety Education, Alcoholism, Public Health Agencies, Maternity and Infant Hygiene, Child Welfare Activities, School Hygiene, Clinics and Out-Patient Departments, and the Blind.

Each article includes a definition of the field, history and present status, and developments and events during 1929. Contributors to the *Year Book* are leaders in their respective fields, and the references which they have listed for consultation provide important bibliography for study.

FRANCIA BAIRD, R.N.

MANUAL OF THE DISEASES OF THE EYE: FOR STUDENTS AND PRACTITIONERS. By Charles H. May, M.D. Thirteenth edition, revised. New York: William Wood and Company. 1930. 458 p. ill.

Some thirty years ago there appeared a small textbook on ophthalmology by Dr. Charles H. May. It was not written for ophthalmologists nor was it intended as a substitute for the larger textbooks. It was specifically prepared for students and general practitioners.

Ophthalmology was in that day as in this supposed to be the nearest to a pure science of any branch of medicine. There were only a few men who practised it as an exclusive specialty, most ophthalmologists even in the larger cities including with it the ear or the nose and throat. Most general practitioners, then as now, when appealed to, were apt to say, "I know nothing about the eyes," or "I never touch the eye," while the teaching of the student often left him with a much better idea of where to refer his eye patients than what to do for them himself. Dr. May's little book offered the student a framework of ophthalmology on

which he could build: from which he could get a correct and intelligent idea of what it was all about before he began to study it in detail. It will serve that very purpose today.

Dr. May believed that the general practitioner ought to treat the commoner eye conditions of his patients which did not require special knowledge or instruments, and from the first these were the conditions on which the emphasis was placed in the way of unusually profuse illustrations, careful description, differential diagnosis and conservative treatment. There were other conditions which the family physician ought not to handle under ordinary circumstances but of which he ought to have an intelligent knowledge; operations and treatment which he need not know in detail but of which he should know the purpose and the plan and the prognosis. Much less emphasis was placed on the rare conditions.

The little volume was a great success from the start, a second edition appeared the next year and others have followed ever since at brief intervals, many of them having been reprinted several times, until this, the thirteenth, which lies before us. In each the original plan has been rigidly followed; more and better illustrations of the common things, a careful condensation of the text, a regular elision of the obsolete and an inclusion of the new as fast as it has become accepted. We note for instance a short chapter on the slit lamp and the corneal microscope, not enough, to be sure, to teach their use but giving a clear idea of their purpose; on the Gonin operation for retinal detachment, which seems to have proved its utility; note that over the world as a whole the trephine operation for glaucoma is beginning to lose ground to other methods. It would be difficult indeed to write a better book for the purpose for which it was intended. But meantime its public has expanded, for it meets no less well the needs of the lay workers in the field of public health, the nurses and the social service workers who need a brief intelligible book about the eye.

The book has been as popular abroad as at home. There have been six British editions sponsored originally by Claud Worth. It has been translated into Spanish, French, Italian, Dutch, German, Japanese and Chinese, some translations appearing in many editions. It has been the best possible example of the benefits of

mass production in ophthalmic publications. The abundant illustrations and numerous colored plates, often better than those of large text books, would be simply impossible in a book with a small circulation.

Certainly from the standpoint of prevention of blindness, which from day to day depends chiefly on the wide dissemination of present knowledge, no more useful book was ever penned.

ELLICE M. ALGER, M.D.

THE FOUNDATION OF HEALTH: A MANUAL OF PERSONAL HYGIENE FOR STUDENTS. By William Barnard Sharp, S.M., M.D., Ph.D. Third edition, revised. Philadelphia: Lea and Febiger, 1930. 308 p.

This text is intended for use in the early college years. It is based upon the courses prepared by the author for junior college students at the University of Chicago and for pre-medical students at the University of Texas.

The book presents, in inclusive manner and compact form, the essential scientific information which forms the basis of hygienic practices. After a general introduction, the hygiene of the various functional systems is presented, and in the final chapters there is consideration of some matters of general health interest, such as the "Hazards of Childhood," "Health in the Home," and "The Modern Health Movement." It is largely in these last chapters that this present edition differs from the previous ones.

The author states that his object in presenting such a wide range of material in such compact form is "the clarification of the perspective of an extremely broad subject to the lay mind, and the presentation of hygiene as influenced by all the medical sciences, briefly, and without distorting proportions or obscuring essentials with detail." These objectives seem to have been realized. The material is scientifically accurate, up-to-date, and presented with unbiased authority. The book should be useful as a reference for the lay reader or as a text for the pre-medical student. As a text for junior college students in general it is of doubtful value. The approach is too logical and too little psychological, and the content is of too factual a nature.

In such an inclusive picture of hygienic practice, the amount of space devoted to one topic must necessarily be very limited. The discussion of the care of the eye covers five pages and includes the following topics: vision, accommodation, squint, eyestrain, refractive error, visual aging, excessive glare. The chapter on "The Membranous Covering" has two pages on "Infections of the Eye, Conjunctivitis, and Foreign Bodies in the Eye." Except for the use of a glossy paper, the book is well set up from the point of view of the general standards for reading materials.

MARGARET PHELPS
THOMAS D. WOOD, M.D.

TRANSACTIONS OF THE INTERNATIONAL OPHTHALMOLOGICAL CONGRESS, HOLLAND, 1929. 4 vol. (*Continued from March issue.*)

That the crusade against trachoma is launched with the enthusiastic support of many devoted workers in clinics, hospitals and laboratories, and with the co-operation of officials of many governments, is indicated by the space given to this subject and by the response from all who have a place in their hearts for the suffering millions in all parts of the world.

In the first number of this REVIEW, Dr. Park Lewis reviewed a book by Morax and Petit which contains more information than can be given in these pages, and to repeat what Dr. Lewis has so admirable summarized would be superfluous.

There is romance in the quest for the cause of this disease which, as Dr. Harvey J. Howard has stated in the Proceedings of the 1929 Annual Conference of the National Society for the Prevention of Blindness (p. 123), afflicts 100,000,000 people in China, while other countries in Asia and Africa have even larger percentages of the population infected, and there is a heroic quality in the response from many countries most afflicted.

In the summary entitled, "The Trachoma Map of The World," Wibaut, of Amsterdam, in "XIII Concilium Ophthalmologicum, 1929, Hollandia," Vol. III, states:

"Although in many countries the trachoma situation is a terrible one, there is no reason, so far, for too pessimistic an outlook. Even in the most affected countries (Egypt, Palestine), the fight against

trachoma does not seem to be without effect. Apart from direct campaign, the progress made in the improvement of social conditions and education tends to a decrease of the disease. Before we review the different measures we must affirm that treatment on as large a scale as possible is the alpha and omega of attack and prophylaxis."

The measures generally advocated are: control of the frontiers; compulsory notification; examination and treatment of school children; examination and treatment of recruits; more physicians, more oculists, more hospitals and free treatment; general hygienic measures; increase of general welfare; scientific investigation; and international collaboration.

The very important contributions of Dr. Harvey Cushing and Mr. Gordon Holmes on the subject of the diagnosis and treatment of suprasellar tumours are well worthy of their place in this distinguished group of papers. Although the work of these men, who are pioneers in the field of neurological surgery, belongs essentially in a special field, it is, as Dr. Cushing well states, "a place where ophthalmologists and neurologists have long had a common place of meeting; and now that roentgenologists, endocrinologists, rhinologists and neurosurgeons have begun to travel the same way, the need, either of a traffic officer or a system of therapeutic stop-and-go signs, begins to be apparent. All will concede that the ophthalmologist has the right of way, for his is the oldest of the specialties concerned; and yet the neurosurgeon who represents the newest of them need not be unduly apologetic for his presence in the traffic and for occasionally sounding his horn." It would be interesting to review these papers, but it is quite impossible in this place, nor would it serve a useful purpose in this REVIEW.

Throughout the two volumes of scientific contributions there are numerous papers of great clinical interest, and in some cases, in addition to those that have been mentioned, there are contributions of pathological value.

In an additional volume of reports on the standardization of vision, the following contributions may be mentioned:

"Standardization of Visual Acuity," by Prof. Marcel Dufour, Nancy, and a similar report by Prof. Elschnig, Prague, both of which offer material for careful study.

The question of perimetry is treated adequately by H. Lauber,

Vienna, H. M. Traquair, Edinburgh, and Luther C. Peter, Philadelphia.

Other papers are more essentially of technical interest, which need not be mentioned in this place, including an essay on "Light Sense," by Ovio, with numerous references to literature on the subject.

In this volume will also be found a series of reports which are exceedingly suggestive and offer material for careful study for those who are interested:

In a report upon the unification of visual requirements for aviators, chauffeurs, railroad employes and sailors, the papers of Mr. McMullen on the methods of testing visual acuity, and of the field of vision, by Dr. Arnold Verrey; of the sense of relief or depth, by Rene Onfray, are especially stimulating.

The testing of the color sense, among other points, shows divergence in various countries, and so much need of co-ordination that it is to be hoped these important questions will be studied again, and at some future time that a comprehensive result may be reached.

A field which, under the title "Psychotechnique" (Dr. Arnold Verrey), offers valuable suggestions for the examination of those who bear the responsibility not only of their own lives, but of others, in the growing fields of land and sea and air. This paper should be read by all who are interested in testing aviators, chauffeurs, and engineers. The idea seems to have been developed especially in Paris and in Berlin, and should be of universal interest. Among the conclusions of the Commission may be stated briefly the following general rules:

The visual examinations should always be made by oculists, or, in all cases, by physicians who have a special knowledge and who have had special ophthalmological training.

All examiners should know exactly their own field of vision.

The examination of the color vision should only be made by those who themselves have a normal color sense.

All pupillary reaction should be noted at each examination.

For the visual acuity, the Snellen cards at 5 meters, lighted at least with 30 lux.

The fields of vision should be always mentioned. The digital method suffices, but an apparatus should be used in case of any hesitation. Ex-

ceptions to this: aviators, conductors of public vehicles, for whom a perimetric chart should be attached to the report of the examination.

In conclusion an interesting report is made by Prof. Lindner, of Vienna, and Dr. Parker, of the University of Michigan, on the uniformity in the program of ophthalmology for doctors in general and future ophthalmologists.

COLMAN W. CUTLER, M.D.

THE WORLD OF THE BLIND. By Pierre Villey, translated by Alys Hallard. New York: The Macmillan Company, 1930. 403 p.

The world of the blind! What ideas do these words call up in the mind of the uninformed sighted person who meets, possibly for the first time, a fellow creature deprived of physical vision! Many of us have reason to suspect that little at all in the shape of ideas is really present to this mind. Surprise there may be, pity almost certainly, bewilderment and mystification sometimes, but clear, logical deduction little or nothing. There is, indeed, great need that the public should be told that the blind do live in a world and that that world is, after all, not remarkably different from that inhabited by the majority of mankind. And who could better do the telling than Professor Pierre Villey of Caen, France, without doubt the greatest living blind man of letters and also one of the greatest authorities on the history, psychology and education of the class of which he is so distinguished a member? Also what better title could be chosen for his work of instruction than that formed by the words which introduce this inadequate review? Professor Villey has shown his keen insight into what his task implies by calling his book *The World of the Blind*. "The blind are victims of the ignorance of the public," he says, and he considers it his duty (and such indeed it is) to substitute knowledge for ignorance because only in knowledge is there the possibility of correction.

Professor Villey has, in this first comprehensive work in a series (*The World of the Blind* first appeared in 1909, I believe), treated his subject with that thoroughness, erudition and style which one would expect of the author of *The Sources of Montaigne*. And though the book comprises, in its present edition, nearly four hundred pages, one is struck with the complete absence of padding.

Every word is necessary and every word goes home to its mark. The whole world of the blind is indeed circumnavigated and thoroughly explored. Of course, the intelligent and observant blind reader will not find himself always in complete accord with deductions drawn from the author's personal experience or the investigations of others. But this is inevitable. Effects whose causes cannot be absolutely determined but must be inferred or arrived at by most minute and painstaking experiment inevitably fall short of absolute demonstration.

In many respects the last divisions of *The World of the Blind* (section 4, "Indications About the Affective Life," and section 5, "Psychology of the Blind in Society") are full of major interest to the reflective reader. These sections deal directly and definitely with the inner life of the blind and its reaction on their attitude to society. Here again I find myself slightly at variance with some of Professor Villey's conclusions. But perhaps, after all, my difference of opinion is merely a difference of light which makes me see the picture under different conditions from those present in the mind of the artist who painted it.

In the section on the psychology of the blind in society, we find once again the complete normality of the writer of *The World of the Blind* and his belief that his fellow citizens in that world can and should be as sane and normal as himself. In this he is right. He is still more right when he points out that the attitude of the blind in society depends upon the attitude of society toward the blind. All observant blind people today are of opinion that the real solution of the problem facing the blind is social in its major aspect. Society must learn to take blind people for what they are, making only those allowances involved in the slowing down of industrial output, differences of educational opportunities, etc., but realizing that mentally and spiritually a blind man is, or may be made, every whit as normal as his sighted brother. This is, after all, the statement and the plea of *The World of the Blind*. Since the appearance of this work no one can claim to be well read in the literature of the subject without being familiar with its contents. It is at the same time a monument and a guidepost. Let us admire its beauty and follow its directing arm.

S. C. SWIFT

Briefer Comment

HYGIENE OF THE EYE. Harry Gradle, volume 7, Health and Life, edited by Dr. Morris Fishbein. Chicago: Manning Publishing Company, 1931. p. 9 to 22.

As a part of the "Health and Life" series, published in eight volumes, these twenty-four pages afford a half-hour consultation with the professor of ophthalmology of the University of Illinois Medical School, in which the lay reader is agreeably introduced to an understandable explanation of the mechanism of the eye, its refractive variations and irregularities. The author sensibly omits any discussion of eye disease, although he warns the reader that any slight inflammation of the eye or lid is sufficient symptom for consulting a physician, who may tell whether it warrants the advice of an ophthalmologist. Sight conservation is served in the sections on "Light for Reading," "Removal of Foreign Matter," and "Routine Cleansing."

THE PRESCHOOL CHILD, Child Study Outlines, prepared by Elsie H. Langsdorf, Chairman of the St. Louis Council for Child Study and Parental Education. Published by the National Federation of Temple Sisterhoods, 1930. 140 p.

This book presents in outline form the application of religious principles to present-day knowledge of physical and mental health. The outlines aid the prospective leader in bringing into play the greatest co-operation and contribution of the mothers. Mrs. Langsdorf has succeeded in utilizing the best material in a broad field, and in presenting it concisely and forcefully to the reader.

MODERN LIGHTING, Frank C. Caldwell. Engineering Science Series. New York: The Macmillan Company, 1930. 386 p.

A comprehensive picture of the problems and methods of modern lighting by artificial means is presented in this recent volume on illumination. Basic theory and units, requirements for good lighting, light sources and modification, measurement of illumination and design of light systems, present the fundamentals of illuminating problems. Specific systems are discussed in chapters of industrial lighting, lighting for offices, exhibits, homes and schools,

streets and for signs and signals. Although the book is comprehensive in scope, the material is a unification of much that has already found its way into engineering magazines. Of interest and value to the layman in light engineering problems, or to the student of engineering whose interest in lighting is secondary, it will not add to the information of the initiate.

TEN YEARS OF THE PUBLIC HEALTH INSTITUTE OF CHICAGO. Annual report of the Public Health Institute of Chicago, 1930. 36 p. Anyone interested in sight conservation and prevention of blindness is aware of the importance of eliminating venereal diseases, which are a cause of much blindness and damaged vision. This report traces the history of the Public Health Institute of Chicago, which, ten years ago, when it first opened its clinic for the treatment of venereal diseases at cost, received 77 patients a day. Today 1,300 people come to the Institute for examination and treatment of venereal disease. It has grown from a small organization with one attending physician to be, with its four clinics and thirty-four physicians, the largest venereal disease clinic in the world. But the figures of physical growth cannot give any picture of what it has done, through its educational work and newspaper publicity, in educating people in the dangers of venereal disease, and in teaching them the necessity of seeking prompt and reliable medical attention.

LIGHTING FOR SEEING. By M. Luckiesh and Frank K. Ross, Lighting Research Laboratory, General Electric Company, Nela Park Engineering Department. 1931. 47 p.

Systematized glimpses of scientific investigations on light, lighting and vision and an interpretation of this material into terms of lighting practices. A well-presented study of the scientific facts back of the most efficient type lighting systems. Factual and valuable material for lighting engineers, its clear and simple presentation makes it interesting and understandable reading for the layman.

STUDIES IN ILLUMINATION, Public Health Bulletin No. 197, on "A Study of the Loss of Light Due to Smoke on Manhattan Island, New York City, During the Year 1927, Especially in Its

Relation to the Nature of the Weather, the Relative Humidity of the Air, and the Velocity and Direction of the Wind."

Description of materials and methods in measuring the loss of sunlight over New York City caused by the ever-present smoke and soot. Taking two points in the city—one over a congested manufacturing area, the other in lower New York Bay—it was found that at the same time the sunlight and natural illumination for the industrial area fell considerably below the amount for the lower bay. Loss of light depends on the altitude of the sun, the nature of the daylight, the relative humidity of the air and the velocity of the wind. The average percentage loss of light is greater for cloudy than for clear days. This study, from a prevention of blindness point of view, will be of particular interest to illuminating engineers who must consider sources of natural as well as artificial light.

Contributors to This Issue

Dr. J. Milton Griscom, professor of ophthalmology, Graduate School, University of Pennsylvania, Philadelphia, is also editor of the *Transactions* of the American Ophthalmological Society. His many contacts with children have given him a practical viewpoint in looking forward to a greater prevention of blindness.

Mr. Louis Resnick is director of industrial relations of the National Society for the Prevention of Blindness, and co-author of *Eye Hazards in Industrial Occupations*. He was formerly editor of the *National Safety News*.

Miss Louise Rush, a teacher in the sight-saving class in Toronto, utilized her year as exchange teacher in the "myope classes" of Glasgow to add not only to her own information but to the collective information of sight-saving class teachers in America, before whom she first gave the paper which she writes for the SIGHT-SAVING REVIEW.

Mr. C. G. Henderson, President of the All-India Blind Relief Association, retired from the Indian Civil Service, has spent eighteen years in work for the blind and prevention of blindness in India. Recently he was a visitor in the United States as a delegate to the World Conference on Work for the Blind.

After twelve years of experience as a public health nurse specializing in school work, **Miss Mary Ella Chayer, R. N.,** may speak with authority on the duties of the school nurse in conservation of vision. At present Miss Chayer is an instructor in the Nursing Education Department of Teachers College, Columbia University.

Miss Gertrude Utstein, of the junior staff of the National Society, has been engaged in library research and special feature writing. Her article appearing in this issue of the REVIEW is the result of preparing an answer to many inquiries regarding the history of spectacles.

A member of the Board of Directors of the National Society, **Dr. Ellice M. Alger,** is professor of ophthalmology of the New York Post Graduate Medical School. As chairman of the Committee on Medical Social Service in Eye Clinics of the National Society, he has put much thought on the subject on which he writes editorially.

The major interest of **Mrs. Winifred Hathaway,** associate director of the National Society, almost from the beginning of her work with it fifteen years ago, has been sight-saving classes. She is the representative of the National Society who promotes the development of sight-saving classes as well as training teachers for this work.

Among the Book Reviewers: **Dr. G. T. Buswell** is professor of educational psychology at the University of Chicago; **Miss Francia Baird** is supervisor of prevention of blindness work of the Missouri Commission for the Blind; **Miss Margaret Phelps** is an assistant to **Dr. Thomas D. Wood,** professor of physical education, Teachers College, Columbia University, with whom she collaborated in this issue's book review; **Dr. Colman W. Cutler** was introduced in the past number of the SIGHT-SAVING REVIEW as member of the Board of Directors of the National Society and a practicing ophthalmologist; **Mr. S. C. Swift,** chief librarian of the Canadian National Library for the Blind, is himself of the "world of the blind."